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FOR

JOINT ANNUITIES & SURVIVORSHIP ASSURANCES

BASED ON

THE CARLISLE MORTALITY

AT

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WITH

TABLES OF ANNUITIES & ASSURANCES ON SINGLE LIVES,
AND OTHER USEFUL TABLES,

AND

AN INTRODUCTION ON THEIR CONSTRUCTION & USE.

BY DAVID CHISHOLM,

ACTUARY TO THE NORTH BRITISH INSURANCE COMPANY,
FELLOW OF THE INSTITUTE OF ACTUARIES, LONDON, AND OF THE FACULTY OF ACTUARIES,
EDINBURGH.

VOLUME I.

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Manager

OF

The North British Insurance Company,

BY

THEIR OBLIGED AND FAITHFUL SERVANT,

THE AUTHOR.

PREFACE.

THE object of the present publication is to provide the Actuary with a complete series of Life Assurance Tables, on the system originated by the late Mr. George Barrett, and improved by Mr. Griffith Davies. The computation of them was commenced about the beginning of the year 1854, and carried on with as much regularity as a due regard to other duties and engagements would permit. But the author's efforts in prosecuting his design, and in bringing his labours to a termination, have been greatly stimulated by a long-cherished desire to exhibit a development of the principles contained in a paper* by him on a "New Method" of constructing Tables of Survivorship Assurances, and to present the results in such a form as would be useful to the profession, more especially as no such Tables had been previously published.

This object has now been attained by the publication of the Tables contained in Vol. II., entitled "Commutation Tables for Survivorship Assurances," to which have been prefixed a copious list of Formulæ, including most of the cases that are likely to occur in practice. They have been computed on the Carlisle basis, as being understood to be that

* On a New Method of constructing a Table of the Probabilities of Survivorship between Two Lives for every combination of ages, and also a Table of the Present Value of Survivorship Assurances of £1 on (x) against (y).—*Assurance Magazine*, vol. ii., p. 305

most generally used by Life Assurance Offices. And though this basis has been held by some Actuaries not only to be limited in extent, but somewhat imperfect in arrangement, there is reason to believe, nevertheless, that in its general features the Carlisle Table gives a sufficiently accurate representation of the law prevailing amongst the majority of associations for Life Assurance, and that the corrections which future experience may show to be necessary, will not be of a very important description.

On account of many radical errors in Mr. Jones' Tables, the Author found it necessary to recompute the D and N columns for Two Lives on the Carlisle basis, to be used as divisors for the new Tables. These will, therefore, be found to occupy the greater part of Vol. I., beginning with Table XXXV., and a list of differences between the two sets of Tables will be found on page xcii., from which Mr. Jones' Tables may be corrected to that extent.

In addition to the Tables on Two Lives, a complete series of Commutation Tables from original computations for Single Lives has been added, along with their logarithms, together with a few new Tables, not before published, which, it is hoped, will be found useful.

Those under the head of "Monetary Tables" are also from original computations, with the exception of Tables I. and II., and any errors discovered in collating them with others of the same kind have been corrected.

In the Introduction, the new and ingenious method devised by Edward Sang, Esq., Edinburgh, for the construction of Tables, has been minutely described in explaining the construction of those in this work; while the opportunity here afforded has been embraced in order to show its application to the construction of Office Tables generally. As the system is essentially logarithmic in its character, it is convenient that the logarithmic index of those numbers that are of less value than 1 should be made positive instead of negative, as recommended by Mr. Sang. This deviation from correct theory,

which is supported by the high authority of Callet, has accordingly been followed in the Tables, and throughout the work, and is practically a great improvement. The change is effected simply by adding 10 to the index, which in reality makes it 10 too great. In regard to this circumstance, however, Mr. Sang observes, "An increase of 10 in the index of a logarithm corresponds to a multiplication of ten thousand million; and, since one can hardly mistake between the true result and one ten thousand million times too great, no practical ambiguity can arise from this conventional latitude."

It will be observed also, that the symbols made use of in the Formulæ applicable to the Survivorship Tables of Vol. II. have been assimilated to those adopted by Mr. Gray in his works, excepting only his symbol for the Joint Assurance. $A_{x,y}$ will therefore denote the value of £1 payable on the decease of (x) or (y) in place of the symbol $A_{x,y}^1$ of Mr. Gray. Consequently $M_{x,y}$ has been preferred to $M_{x,y}^1$ and $R_{x,y}$ to $R_{x,y}^1$, for the simple reason that the figure 1 placed above and between the suffixes x,y is very apt, from its being accidentally misplaced and made to stand nearer to x or y , to convey the idea of a specified condition, when none is intended. Another reason for discarding the figure 1 above the suffixes is, that if the column M were computed *directly* from the joint decrements, as shown under Art. 193 of Mr. Jones' work, the most natural symbol for the joint contingency at any two given ages would be $M_{x,y}$, it being generally understood that the right to a Joint Assurance is determined by the failure of *either* of the lives, and therefore a contingency which does not need to be marked.

A copious list of Formulæ has also been prefixed to the Tables of Vol. I. These have been chiefly collected from the lists given in Jones' work, and the Registrar-General's reports, to which a few new cases have been added, adapting the whole to the tabulated form of the N and S columns of this work.

A Specimen Table of Results has been appended to Vol. I., page 357, exhibiting the results of the division of N_x by D_x , and of $M_{x,y}^1$ and

$M_{x,y}^1$, respectively by D_x , for difference of age 15; in the one case giving the value of the joint annuity, and, in the other, the value of the contingent assurance. In reference to this matter, the author takes the present opportunity of stating that the materials in his hands for computing such Tables for all differences of age, would enable him, or any other Actuary, to do so in a much shorter time than if the whole work had to be performed *ab initio*. If the profession, therefore, think it desirable that they should be got up for publication, he will be most happy to give the use of his manuscripts, or any part of them, for that object, though he cannot at present say that he would be disposed to undertake such labour himself.

D. C.

EDINBURGH, 5th February 1858.

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INTRODUCTION.

CONSIDERING the extent to which the business of Life Assurance is carried on in the present day, and the numerous interests constantly depending on the duration of life, the value of Life Tables to the Actuary will not admit of a doubt. Besides the aid which the Tables most commonly in use afford, his varied investigations constantly call for the formation of new Tables, more in accordance with the improved knowledge of Life Assurance, and the increasing exigencies of the times. The question therefore as to the mode of forming them becomes an important one, as his other professional duties will not always enable him to command sufficient time to engage in the construction of voluminous Tables; and when these must be got up, the duty is often entrusted to those who, from their defective acquaintance with the theory, cannot be expected to possess those qualifications for the task requisite for imparting to their results that reliability which is so desirable.

In general, Tables will be found to be more expeditiously and safely constructed where the method to be pursued can be so adjusted that one arithmetical operation only is performed continuously before a change be made. When this can be managed, the process becomes merely mechanical, and Tables so arranged for computation may easily be formed by persons possessing only an ordinary arithmetical knowledge. This condition strikingly characterises the bulk of the Tables composing these volumes, and they are accordingly presented as the fruits of a system which is believed to be as effective for the construction of Life Tables as any hitherto published.

PART I.

ON THE CONSTRUCTION OF LIFE TABLES.

The chief design of the present work being the publication of the Tables comprised in the second volume, it forms no part of the author's aim to enter

here upon the theory of Life Annuities and Assurances, any farther than to explain the construction of the Tables. But as he believes his aim would be better secured by exemplifying, in the first place, the construction of Tables generally, it may not be out of place to premise a description of the method employed, by a glance at the general theory of a life annuity, and manner of determining its value. This has been so well explained by the late Mr. Griffith Davies, the distinguished improver of Barrett's system of computation, and his reasoning bears so directly upon the method which we propose to illustrate, that we prefer to quote the Author's own words, using the Carlisle in place of the Northampton Table.

In his posthumous "Treatise on Annuities," p. 219, Mr. Davies says: "The principal difficulty to be encountered in determining such value consists in the quantity of mechanical labour necessary to perform the calculation.

"For example: Suppose a number of children just born were proposed, and it were required to find the value of £1 annuity payable during the life of each of them, reckoning interest at 3 per cent per annum, and assuming the mortality among the whole to be correctly expressed by the Carlisle Table.

"Referring to Table IX., p. 24, it will be found that, according to the rate of mortality here assumed, out of

10000 children just born.				
8461	may be expected to survive	1	year.	
7779	— — —	2	years.	
7274	— — —	3	do.	
6998	— — —	4	do.	
	etc.		etc.	

"Conceiving therefore that a Fund were now formed, sufficient to provide £1 per annum, during life, for each of these 10,000 children, it is manifest that such Fund must be adequate to pay

£8461 at the end of the 1st year.			
7779	— —	2d	do.
7274	— —	3d	do.
6998	— —	4th	do.
	etc.		etc.

"Hence, by discounting these sums respectively for 1, 2, 3, 4, etc. years, it will be found that, at 3 per cent, the present value of the

1st payment is	8461	×	.970874	=	8214.563
2d do. is	7779	×	.942596	=	7332.454
3d do. is	7274	×	.915142	=	6656.740
4th do. is	6998	×	.888487	=	6217.632
etc.			etc.		etc.

“ The same process continued to the extremity of life gives the present values of the several payments due at the end of the 5th, 6th, 7th, etc. years, to the end of life, as in column D_x of Table XI., Vol. I.

“ Having thus determined the present value of the 1st, 2d, 3d, etc. payments to the 104th, by adding them together, their sum £173198.2348 (found opposite to Age 1 in Table XI., being the age at which the first payment of the annuity falls to be made) gives the amount of the Fund, which, when improved at 3 per cent, would just provide for the several payments as they respectively become due ; or in other words, provide a curtate annuity of £1 for each of the 10,000 children, supposing them to die off as expressed by the Carlisle Table. Hence, dividing the whole Fund by the number of lives proposed, we have the average value of each annuity

$$= \frac{173198.2348}{10,000} = 17.31982 = £17 : 6 : 4$$

as required.

“ Similarly, if it were required to find the value of an annuity on the life of a child aged one year, we should as before refer to the Table of Mortality, and conceive the life proposed to be one of 8461 children, all of the same age and prospect of longevity, and upon whose lives similar annuities are made payable. This assumption being made, it is manifest that a fund sufficient to provide for all these annuities must be adequate to pay

£7779 at the end of the 1st year.					
7274	—	—	2d do.		
6998	—	—	3d do.		
6797	—	—	4th do.		
etc.			etc.		

“ This being respectively multiplied by the present value of £1, to be received at the end of 1, 2, 3, 4, etc. years, and the operations continued to the extremity of life, the results, being added together, would produce £169933.18166 for

present sum, which, when improved, would just provide for the annuities proposed. Hence, dividing this sum by the proposed number of lives, we have $\frac{169933.18166}{8461} = 20.08429 = \text{£}20:1:8$ for the value of each annuity, as was required to be found.

“By the same process, the value of an annuity on any other age may be determined. Nor does it appear that any shorter method can be applied to determine the value of an annuity on any isolated age. To construct a Table for all ages by this method would, however, be excessively laborious; but it fortunately happens, when this is our object, the operations performed in the calculation of the value of an annuity on one age may be made subservient to determine the values of similar annuities on other ages, by which means it will be found that the construction of a Table to represent the values of annuities on all ages requires but little more labour than that which must be performed to determine the value of an annuity on the life of a child just born.”

The truth of this remark of Mr. Davies will appear, on reflecting that $\frac{169933.18166}{8461}$ will give the value of an annuity for Age 1, whether we increase or diminish the numbers composing the numerator and denominator of the fraction, provided we preserve the ratio between them; that is to say, provided we multiply or divide both numerator and denominator by the same number. Suppose, then, that we multiply both in this case by .970874, being the multiplier of 8461 in the vertical columns on p. xiii. we shall have $\frac{164983.6717}{8214.563}$ as the new fraction, which, when reduced, will give 20.08429 as the value of an annuity of £1 on Age 1 as before.

Again, the process of calculating the value of an annuity of £1 on Age 4 on the principles explained by Mr. Davies, may be represented as follows:—

Age.				
0,	10000			
1,	8461			
2,	7779			
3,	7274			
$x = 4,$	6998			
5,	$6797 \times .970874 =$	6599.02915	Value of 1st year's payments.	
6,	$6676 \times .942596 =$	6292.77030	Do.	2d do.
7,	$6594 \times .915142 =$	6034.44411	Do.	3d do.
8,	$6536 \times .888487 =$	5807.15136	Do.	4th do.
	etc.	etc.		etc.

This process being continued as before to the end of life, and the several pro-

ducts summed up—that sum, according to Mr. Thomson's "Student's Table,"* column 4, will be found to be, 162948.97932. Hence, dividing this by the number of lives existing at Age 4, we have the value of an annuity for that age $= \frac{162948.97932}{6998} = 23.28488$.

As before, however, we may multiply numerator and denominator by any given number before division, without affecting the result. Let that number be in this case .888487,† the multiplier of 6998 in the vertical columns on page xiii., and we shall have $\frac{144776.8453}{6217.6324}$ as the new fraction, which, when reduced, will give 23.28488 for the value of an annuity of £1 at Age 4 as before.

We may continue this process for any other age with the same results. But if the several vertical columns on p. xiii. were completed to the end of life, and the products summed up, we shall find that the *numerator* of the fraction $\frac{164983.6717}{8214.563}$ is the sum of all the products for those ages *older* than Age 1, and that the numerator of $\frac{144776.8453}{6217.6324}$ is likewise the sum of the products for those ages that are *older* than Age 4,—the denominator in each case being that product opposite to the given Ages 1 and 4 respectively.

Hence it appears that the value of an annuity for any given age may be obtained from the column of products on p. xiii, and another column representing the sum of those products from each age to the end of life, being the columns originally framed to determine the value of an annuity on the life of a child just born.

If these results are expressed according to the usual notation, x denoting the given age, l_x, l_{x+1}, l_{x+2} , etc., the numbers living at that age and the next succeeding, and v the present value of £1 due one year hence, the value of the annuity will be

$$\frac{l_{x+1} \cdot v + l_{x+2} \cdot v^2 + l_{x+3} \cdot v^3 + \dots + l_{x+n} \cdot v^n}{l_x}$$

If we multiply the numerator and denominator of this expression by v^x , we shall have, as a general expression for the value of an annuity,

$$\frac{l_{x+1} \cdot v^{x+1} + l_{x+2} \cdot v^{x+2} + l_{x+3} \cdot v^{x+3} + \dots + l_{x+n} \cdot v^{x+n}}{l_x \cdot v^x}$$

* The Student's Table, by W. T. Thomson, Esq., Manager of the Standard Life Assurance Company, is calculated on the principle now explained, the different products being arranged in 104 vertical columns discounting from each age, and therefore always divisible by the number living at the respective ages. The Table also gives the progressive sums of the products from each age, and is therefore admirably adapted for illustrating the calculation of Life Annuities on the principle explained by Mr. Davies.

† .888487 = (.970874)⁴ = v^4 that is, equal to v^4 .

or by multiplication of the factors,

$$\frac{D_{x+1} + D_{x+2} + D_{x+3} + \dots D_{x+n}}{D_x} = \frac{N_{x+1}}{D_x}$$

On referring to Table XI., the several products of the column on p. xiii. will be found under the head D_x , while the sum of these products from each age and upwards will be found under the head N_x . As these are fundamental columns for the calculation of annuities on lives, they are consequently in frequent request, and have been formed from time to time on various rates of mortality and at different rates of interest. The mode of effecting the multiplication of the factors and completing the columns is therefore a matter of some consequence to the Actuary.

Neither Mr. Davies nor Mr. Jones, in his Treatise on the Value of Annuities and Reversionary Payments, have stated how the numbers in column D were obtained. From article 113 of Mr. Jones' work, it would appear that they were obtained by actual multiplication, while the corresponding values of N, and probably the values of the annuity also, were found in succession for each age, beginning at the oldest.

Tables of this kind have no doubt been, and may again be, computed very accurately in this manner; but it is quite clear that the different operations of multiplication, addition, and division being all performed in succession for *each* age, by two persons constantly working together, give to this method quite an objectionable character, and greatly increase the probabilities of error.

A better plan would be to compute in the first place all the D's in one column, beginning at the youngest from the top downwards, and then form the column N_x by summing the D's from the bottom upwards. The most expeditious mode of effecting the multiplication and division of such large numbers will be found to be by *logarithms*, although the system is not necessarily logarithmic; and the best method for such purpose with which I am acquainted is one devised, a number of years ago, by Edward Sang, Esq., Teacher of Mathematics, Edinburgh, a gentleman well known for his extensive scientific attainments, and as the author of "Tables of Life Assurance and Annuities," and other works. It may be described as follows:—

A large sheet of drawing paper, of about thirty inches in length, is ruled across with blue ink, the lines being equidistant, and rather less than a quarter of an inch asunder. Every fifth line is ruled a degree brighter than the rest, and every tenth line a degree brighter than the fifth. The fiftieth and hundredth lines are ruled still brighter, care being taken to leave sufficient blank space at the top whereon to write the symbol expressing the nature of the Table, after the paper has been cut down into slips for use. The breadth of each slip must depend upon the number

of figures to be written thereon; but for ordinary use, where eight figures or thereby are required, each slip should be about $1\frac{3}{8}$ of an inch wide.

It will at once be perceived, that from the peculiar ruling of the paper, it becomes an easy matter to assign a number to any particular space without the necessity of affixing the ages. The blank space at the top is always reserved for those values which relate to Age 0 or birth; so that Ages 5, 10, 15, etc. will always be found immediately under the bright lines.

With this explanation as to the material to be employed, we shall now show how the Annuity Column, with the previous preparatory columns D_x and N_x , is to be completed.

Referring to the illustrative example on p. xiii., the column l_x containing the numbers living at each age, should be first written on a slip, *in logarithms*, once for all, and λv^x formed as far as λv^{105} to suit the Carlisle Table.

λv^x will be most rapidly formed by writing λv at the given rate of interest to 10 places of figures on the space reserved for Age 1, and adding it to itself continuously until the column has reached Age 105, the extent required. It should then be transferred to a narrower slip once for all, correct to seven places, which will of course serve for all computations at the same rate of interest. The two slips λl_x and λv^x having been thus prepared and placed together, with a weight on the top to keep them from moving, and a blank slip at the right side to receive the sums, λD_x is formed at once by the addition of these two slips, as in the annexed example.

In adding them together, we begin at the top, and in doing so, it will be found more convenient to add from left to right, though this is not essential. The addition will, however, be performed with more despatch if the logarithms of l_x and v^x are written with a division between the 3d and 4th figures of the mantissa, taking care to write λD_x in the same form.

When λD_x has been formed, and the results compared, the next step in regular order is to obtain the natural numbers; and these in their turn having

FIG. 1.

Formation of λD_x

	Carlisle Mortality. λl_x	3 per cent. λv^x	C	S
			λD_x	
0	4.000 0000	0.000 0000	4.000 0000	
	3.927 4217	9.987 1628	3 914 5845	
	3.890 9238	9.974 3256	3.865 2494	
	3.861 7733	9.961 4883	3.823 2616	
	3.844 9739	9.948 6511	3.793 6250	
5	3.832 3173	9.935 8139	3.768 1312	
	3.824 5163	9.922 9767	3.747 4930	
	3.819 1489	9.910 1394	3.729 2883	
	3.815 3120	9.897 3022	3.712 6142	
	3.812 4454	9.884 4650	3.696 9104	
10	3.810 2325	9.871 6278	3.681 8603	
	3.808 2785	9.858 7905	3.667 0690	
	3.806 1800	9.845 9533	3.652 1333	
	3.804 0031	9.833 1161	3.637 1192	
	3.801 7466	9.820 2789	3.622 0255	
15	3.799 3405	9.807 4416	3.606 7821	
	3.796 6437	9.794 6044	3.591	
	3.793 7206	9.781 7672	3.	
	3.790 7073	9.768 9300	3.	
20	* * *	* * *	* * *	

The above values of N_x being successively found to agree with the corresponding value of N_x , as set down in the N column (Fig. 2), prove the accuracy of the work from that value downwards.

The S column is formed by summing up the N column, in precisely the same way as the N column was formed by summing the D's; and both of these columns have been so tabulated, that N_x includes D_x , and S_x includes N_x . Hence $\frac{N_x}{D_x}$ will give $1 + a_x$, and $\frac{N_{x+1}}{D_x}$ will, of course, give a_x , the ordinary annuity; while the ordinary *increasing* annuity of £1 one year hence, £2 two years hence, and £3 three years hence, etc., is obtained from $\frac{S_{x+1}}{D_x}$. This should be carefully attended to when quoting from these Tables.

If series of Tables at different rates of interest are intended to be computed, the work will obviously be conducted with more despatch and regularity, if all the D's are computed before any of them are summed up, then finding all the N's, and next all the S's, rather than by completing the columns at each rate of interest before another rate is commenced. By the former arrangement, the computers may sit in their own apartments and compare their work afterwards, while by the latter they must necessarily sit together in order to compare their work as each slip is completed, before they can take another step in advance. A slight interruption to one of the computers may, by keeping the other behind, greatly retard the progress of the work; while, by the former arrangement, a little occasional interruption to either of them will scarcely be felt, and may be made up afterwards.

The mode of forming the Assurance columns is exactly similar to that adopted in forming the Annuity columns, the fundamental column in this instance being the column of decrements d_x .

Hence, reckoning interest at 3 per cent, and assuming $x = 0$ the value of £1 payable at the end of the first and following years for each of the lives that fail during those years respectively, will be—

At the end of the 1st year	d_x	$\times v^{x+1} = 1539 \times .970874 = 1494.173 = C_x$
„ „ 2d	d_{x+1}	$\times v^{x+2} = 682 \times .942596 = 642.8506 = C_{x+1}$
„ „ 3d	d_{x+2}	$\times v^{x+3} = 505 \times .915142 = 462.1465 = C_{x+2}$
„ „ 4th	d_{x+3}	$\times v^{x+4} = 276 \times .888487 = 245.2225 = C_{x+3}$
	etc.	etc.

The last value, or that for Age 104, being $d_{104} \times v^{105} = 1 \times .044884 = .044884$.

If these several products be summed up, beginning at the oldest life, in the manner in which D_x was done (Fig. 2), the respective sums will be the numerator of a fraction, of which the corresponding value of D_x will be the denominator,

which will give the value of an assurance for any given age; and if these results be expressed algebraically according to the usual notation, the general expression for the value of an assurance will be

$$\frac{C_x + C_{x+1} + C_{x+2} + C_{x+3} + \dots C_{x+n}}{D_x} = \frac{M_x}{D_x}$$

The different values of C_x may perhaps be more easily found by actual multiplication, the numbers in d_x being small. The following, however, is the mode of procedure by logarithms, and the one adopted in the formation of the Tables.

The slips having been placed, as in the annexed example (Fig. 3), with a weight on the top to keep them from moving, the two columns λd_x and λv^x are added together, beginning at the top, and the sums set down on the opposite spaces of the slip marked λC_x .

FIG. 3.

Formation of λC_x .

Carlisle λd_x	3 per cent. λv^x	C 3 λC_x
	0.000 0000	
3.187 2386	9.987 1628	3.174 4014
2.833 7844	9.974 3256	2.808 1100
2.703 2914	9.961 4883	2.664 7797
2.440 9091	9.948 6511	2.389 5602
2.303 1961	9.935 8139	2.239 0100
2.082 7854	9.922 9767	2.005 7621
1.913 8139	9.910 1394	1.823 9533
1.763 4280	9.897 3022	1.660 7302
1.633 4685	9.884 4650	1.517 9335
1.518 5139	9.871 6278	1.390 1417
1.462 3980		
	* * *	
		* * *
	8.716 2775	
0.301 0300	8.703 4403	9.004 4703
0.301 0300	8.690 6031	8.991 6331
0.301 0300	8.677 7659	8.978 7959
0.301 0300	8.664 9286	8.965 9586
0.000 0000	8.652 0914	8.652 0914
* * *	* * *	* * *

The natural numbers having next been obtained to λC_x from a table of logarithms, the columns M_x and R_x were then got by summation, as in Fig. 4.

As in the case of the Annuity columns, so it is here, that the last values (being C_{104} , M_{104} , and R_{104}) are all equal. C_{104} is therefore transferred to the corresponding space of the columns M_x and R_x , and the two latter moved upwards one step, in order to obtain the sums of C_x and M_x respectively. These should be commenced as before at the bottom, and checked every

FIG. 4.

Formation of Cols. M_x and R_x .

C 3 C_x	C 3 M_x	C 3 R_x
		70 035.6729
4 664.1296	3 169.9546	65 371.5433
2 527.1040	2 064.9575	62 201.5887
1 494.175	1 819.7350	59 674.4847
642.8506	1 646.3506	57 609.5272
462.1465		55 789.7922
245.2225		
173.3844		
101.3356		
		* * *
		1.177 187
	.431 706	.745 480
.101 034	.330 672	.414 809
.098 092	.232 580	.182 229
.095 235	.137 345	.044 884
.092 461	.044 884	
.044 884		
* * *	* * *	* * *

ten lines, as in the example given on p. xviii. for checking the column N_x .

M_x is of course *first* obtained by summing C_x , and next R_x is got in like manner by summing M_x .

When it is necessary to compute and tabulate the Assurance column A_x , the

logarithms of column M_x should be sought out from a table of logarithms; then since λD_x had been previously prepared (p. xvii.), it will now be ready for use in finding λA_x , as in the following example:—

λD_x being the divisor in logarithms, each line of that column is subtracted from the corresponding line in column λM_x , and the difference placed on the opposite line of column λA_x , thus giving the logarithm of the assurance.

It is quite immaterial how λD_x and λM_x are placed with regard to one another, provided λD_x is subtracted from λM_x .

The annual premiums may also be obtained in like manner by substituting λN_x for λD_x and subtracting it from λM_x .

The present values and annual premiums for *Increasing Assurances* may be got in a similar way, by substituting λR_x for λM_x , and using as divisors λD_x and λN_x in logarithms as before, the results or differences being $\lambda I A_x$, and log. Annual Premiums for $I A_x$ respectively.

The facilities afforded by this system of computation for the detection of errors are very obvious.

Thus, in framing λD_x (p. xvii.), if in the computation of λL_x or λv^x any error should be overlooked, a difference must appear in λD_x on its being compared; or if any new error be made in λD_x , though only in one figure, and pass unobserved on its being compared, the chance is much greater that it will be detected in D_x when the natural numbers are compared, as it may happen that several figures are affected.

Again, the D 's having been freed from errors, are summed up; and if any error or errors have been passed over in the comparison, they will most likely be discovered in comparing the N column, or finally the S column. In short, as the undiscovered error appears in a new form by every subsequent step in the computation, the chance of discovery is so much increased that it can scarcely escape detection.

The author of the present work has been in the practice of following this system of computation professionally, for several years, with much satisfaction, and no other method with which he is acquainted could have enabled him to undertake such an amount of labour and responsibility as the accumulated mass of these

FIG. 5.

Formation of λA_x .

C	3	C	3	C	3
λD_x		λM_x		λA_x	
4.000 0000		3.668 7707		9.668 7707	
3.914 5845		3.501 0532		9.586 4687	
3.865 2494		3.402 6231		9.537 3737	
3.823 2616		3.314 9111		9.491 6495	
3.793 6250		3.260 0082		9.466 3832	
3.768 1312		3.216 5225		9.448 3913	
3.747 4930		3.188 9327		9.441 9397	
3.729 2883		3.169 7747		9.440 4864	
3.712 6142		3.156 1116		9.443 4974	
3.696 9104		3.146 0039		9.449 0935	
3.681 8603		3.138 3169		9.456 4566	
* * *		* * *		* * *	
9.670 5200		9.635 1884		9.964 6684	
9.548 5383		9.519 3970		9 970	
9.389 5731		9.366 5720			
9.154 8872		9.137 8129			
8.664 9286		8.652 0914			
* * *		* * *		* * *	

Tables presents. The extent of its utility must not, however, be supposed to cease with the production of the fundamental columns D, N, S, and C, M, R. These having been formed on slips, once for all, at different rates of interest, both in numbers and in logarithms, will be extremely useful if kept in reserve until they are required, and may then be made serviceable in the construction of any subordinate set of Tables which may be wanted for Insurance Offices.

Their value in this respect will be best shewn by a few examples.

PROBLEM I.

To construct a Scale of Single and Annual Premiums for an Endowment of £1.

$$\text{Formula 1.} = \frac{D_{z+n}}{D_z} \text{ Single Payment.}$$

This problem includes two cases, which shall be treated separately.

CASE 1. When the Endowment is payable at a given age.

FIG. 6.
Single Payment for
Endowment at
a given age.

$\lambda D_{60} =$	2.791 2257	
	C 3	C 3
	λD_z	Log. Endowment at 60.
	4.000 0000	8.791 2257
	3.914 5845	8.876 6412
	3.865 2494	8.925 9763
	3.823 2616	8.967 9641
	3.793 6250	8.997 6007
	3.768 1312	9.023 0945
	3.747 4930	9.043 7327
	3.729 2883	9.061 9374
	3.712 6142	9.078 6115
	3.696 9104	9.094 3153
	3.681 8603	9.109 3654
	3.667 0690	9.124
	3.652 1333	
	3.637 1192	
	3.622 0255	
	3.606 7821	
	* * *	* * *
$\lambda D_{59} =$	2.816 5191	9.974 7066
	* * *	* * *

In this case, the numerator is constant and the denominator variable.

Assuming the given age at which the endowment is payable to be 60, we shall in the first place shew how the single premiums are computed.

Lay the slip λD_z (Fig. 6) flat on the table, and alongside of it a blank slip for receiving the results; then write λD_{60} ($= 2.791\ 2257$) on a card or small piece of paper of the same width as the slip, to be held in the left hand, and subtract *from it each* line of the column λD_z , beginning at the top, and place the results or differences on the opposite space of the blank slip up to Age 59 inclusive. The scale will then be completed in logarithms, and nothing is wanting but to get the natural numbers from a table of logarithms, which will of course be the present values of an endowment payable at 60 for each age from birth up to Age 59.

The log. values of an Endowment at any other given age, z , may be obtained in a similar way by writing log. D_z on a card, and proceeding as before, by subtracting from it every value of log. D_z , as far as Age $z-1$.

Cor. A scale of single payments for any other deferred benefits may be obtained in a similar manner. Thus, if z be any older age, we may write on a small piece of paper λN_z , λM_z , λR_z , etc., and subtract from each in succession the several values of λD_z , and the results will be log. Deferred Annuity, log. Deferred Assurance, log. Deferred Increasing Assurance, etc., commencing at Age z .

$$\text{Formula 2.} = \frac{D_{x+n}}{N_x - N_{x+n}} \text{ Annual Premium.}$$

In order to find the Annual Premiums, the divisor, which must represent ΣD_x for *each* age up to 59 inclusive, is again variable, and requires to be previously computed.

The whole process of finding the log. Annual Premium for an endowment of £1 is shewn in the annexed example.

The slip N_x is laid flat on the table, with a clean slip marked $N_x \dots 60$ alongside of it to receive the results. N_{60} ($= 7105.5562$) is then written on a small piece of paper, and subtracted from each of the values of N from birth to 59 inclusive, the differences being placed on the blank slip, to which again the logarithms are sought out and placed on the slip marked $\lambda N_x \dots 60$. We then write on a small piece of paper λD_{60} , ($= 2.7912257$) and *from it* subtract *each* value in column $\lambda N_x \dots 60$, placing the differences on a blank slip alongside of it. The last obtained results

Fig. 7.

Annual Premiums for Endowment
at a given Age.

7 105.5562			2.791 2257	
C 3	C 3	C 3	C 3	
N_x	$N_x \dots 60$	$\lambda N_x \dots 60$	λ Premium Endowment at 60.	
183 198.2348	176 092.67	5.245 7413	7.545 4844	
173 198.2348	166 092.67	5.220 3505	7.570 8752	
164 983.6717	157 878.11	5.198 3219	7.592 9038	
157 651.2181	150 545.66	5.177 6674	7.613 5583	
150 994.4777	143 888.92	5.158 0273	7.633 1984	
144 776.8453	137 671.29	5.138 8434	7.652 3823	
138 913.6934	131 808.13	5.119 9421	7.671 2836	
133 322.6485	126 217.09	5.101 1182	7.690 1075	
127 961.1231	120 855.56	5.082 2668	7.708 9589	
122 801.5443	115 695.98	5.063 3184	7.727 9073	
117 825.2005	110 719.64	5.044 2245	7.747 0012	
* * *	* * *	* * *	* * *	
7 760.9754	655.4192	2.816 5191	9.974 7066	
* * *	* * *	* * *	* * *	

Note.—In describing the mode of constructing a table of log. Annual Premiums, it has been thought better, in order to lessen the number of diagrams, and show the connection of one slip with another, to exhibit at one view the whole number of slips made use of; but it must not be overlooked that the computer is only engaged with two of them at one time, the others being either already completed or yet to be done. Thus, while $N_x \dots 60$ is forming, the only two slips before the computer are N_x and a blank slip at the right hand; and while $\lambda N_x \dots 60$ is forming, N_x is of course removed. In short, whatever appearance the various diagrams or figures present, the computer can never have before him more than three slips at any one time.

are the log. Annual Premiums payable until 60 (the last premium being due at Age 59), to secure an endowment of £1 payable at that age.

Single Payment for Endowment,
payable a given number
of years hence.

If in place of λD_{60} we write on a small piece of paper λN_{60} , λM_{60} , λR_{60} , etc., and subtract as before, the results will be the *log. Annual Premiums* for the several benefits mentioned in the *corollary*, commencing at Age 60.

FIG. 8.

C 3 λD_x		C 3 Log. Endowment 30 years hence.
4.000 0000	3.366 3164	9.366 3164
3.914 5845	3.349 0692	9.434 4847
3.865 2494	3.331 7768	9.466 5274
3.823 2616	3.314 5177	9.491 2561
3.793 6250	3.297 2932	9.503 6682
3.768 1312	3.280 0239	9.511 8927
3.747 4930	3.262 7090	9.515 2160
3.729 2883	3.245 2647	9.515 9764
3.712 6142	3.227 6874	9.515 1732
3.696 9104	3.209 9732	9.513 0628
3.681 8603	3.191 9470	9.510 0867
3.667 0690	3.173 4248	9.506 3558
3.652 1333	3.154 5635	9.502 4302
3.637 1192	3.135 4391	9.498 3199
3.622 0255	3.116 2223	9.494
3.606 7821	3.096 9105	
3.591 2481	3.077 5939	
3.575 4878	3.058 2738	
* * *	* * *	* * *

logarithms, which will be the values required.

CASE 2. When the Endowment is payable a given number of years hence.

$$\text{Formula 1.} = \frac{D_{x+n}}{D_x}$$

In this case, each value of D_x must divide that value of D_x beyond it equal to the number of years deferred, and therefore numerator and denominator are variable alike.

Assume the number of years deferred to be 30. Then take two slips of λD_x and lay them both flat on the table, the one intended as the divisor being 30 steps lower down than the other, or, which is the same thing, placing Age 0 of the one opposite to Age 30 of the other. A blank slip is then laid alongside of them to run straight across with the one lower down. If the slip λD_x lowest down be now subtracted from the other, the difference will be the log. value of endowment of £1 payable 30 years hence; that is, $\lambda D_{x+30} - \lambda D_x = \log. \text{ value endowment } 30 \text{ years hence}$. The natural numbers to this last column should then be sought out from a table of

$$\text{Annual Premium} = \frac{D_{x+n}}{N_x - N_{x+n}}$$

Before we can find the annual premiums, we must in this case also prepare

the divisors from the N column. Each value of N_x must represent the sum of D_x for 30 years from that age, the usual symbol for which is $N_{x|30}$. The values of the numerator and denominator of the formula therefore vary alike, and increase with the age.

This value of N_x is obtained by means of two columns of N_x laid together, as λD_x was in the last example, Age 0 of the one being opposite to Age 30 of the other.

The whole process of finding the log. Annual Premiums is shown in the annexed example.

$$\text{Formula 2.} = \frac{D_{x+n}}{N_x - N_{x+n}}$$

FIG. 9.
Computation
of
Scale of Annual Premiums
for
Endowment,
payable a given number
of years hence.

C	3	C	3	C	3	C	3	C	3
N_x		N_x		$N_{x|30}$		$\lambda N_{x|30}$		λD_x	
* * *		* * *		* * *		* * *		* * *	
47 783.1563	183 198.2348	135 415.0785	5.131 6671	3.366 3164	8.234 6493				
45 458.7270	173 198.2348	127 739.5078	5.106 3252	3.349 0692	8.242 7440				
43 224.7988	164 983.6717	121 758.8729	5.085 5001	3.331 7768	8.246 2767				
41 078.0717	157 651.2181	116 573.1464	5.066 5986	3.314 5177	8.247 9191				
39 014.9841	150 994.4777	111 979.4936	5.049 1385	3.297 2932	8.248 1547				
37 032.1189	144 776.8453	107 744.7264	5.032 3959	3.280 0239	8.247 6280				
35 126.5531	138 913.6934	103 787.1403	5.016 1268	3.262 7090	8.246 5822				
33 295.4660	133 322.6485	100 027.1825	5.000 1180	3.245 2647	8.245 1467				
31 536.4706	127 961.1231	96 424.6525	4.984 1880	3.227 6874	8.243 4994				
29 847.2460	122 801.5443	92 954.2983	4.968 2695	3.209 9732	8.241 7037				
28 225.5358	117 825.2005	89 599.6647	4.952 3064	3.191 9470	8.239 6406				
26 669.7598	113 018.3538	86 348.5940	4.936 2552	3.173 4248	8.237 1696				
25 178.9411	108 372.4626	83 193.5215	4.920 0895	3.154 5635	8.234 4740				
* * *	* * *	* * *	* * *	* * *	* * *				

The two slips N_x having been placed as already stated, it is plain that, as they lie, each and every following value of N on the first slip is exactly 30 years in advance of the value of N on the second slip, each expressing the sum of the D's from that age to the end of life; consequently their difference $N_{x|30}$, which forms the divisor used in finding the annual premium, must express the sum of D_x for

each interval of 30 years from birth upwards.

If the division is effected by logarithms, the logarithms of $N_{x|30}$ must be

sought out from a table of logarithms, and λD_x placed alongside of it, 30 spaces higher up; then $\lambda D_{x+30} - \lambda N_{x|30} = \log.$ Annual Premium for endowment of £1, payable 30 years hence, the natural numbers to which will, of course, give the annual premiums.

Cor. The same mode of construction will also apply for scales of Single and Annual Premiums for Deferred Annuities, the formulæ for which are

$$\frac{N_{x+n}}{D_x} = \text{Single Payment, and}$$

$$\frac{N_{x+n}}{N_x - N_{x+n}} = \text{Annual Premium.}$$

Since the denominators of the above fractions are the same as for endowments, the only changes in the construction necessary to be attended to are the following:—

1. In constructing a scale of *Single Payments* for a Deferred Annuity, to *commence with a payment at any given age*, ex. gr. 60, we have only to substitute $\lambda N_{60} = 3.851\,5981$ for λD_{60} (Fig. 6), and subtract *from it* each value in column λD_x , the difference being the log. Single Payments; and for a scale of *Annual Premiums* subtract each value in column $\lambda N_{x...60}$ (Fig. 7) from λN_{60} , the difference being the log. Annual Premiums.

2. In constructing a scale of *Single Premiums* for a Deferred Annuity to *commence with a payment at the end of a given term of years* (say 30 years), the middle slip (Fig. 8) should be λN_x , Age 30 thereon being placed opposite to λD_0 , and the difference will be the log. Single Payments. For the *Annual Premiums* λN_x should be substituted for λD_x (Fig. 9), placing λN_{30} opposite to $\lambda N_{0|30}$, the latter being the divisor, and the difference will be the log. Annual Premiums.

When speaking of Deferred Annuities, it is usual to understand by *an annuity deferred for n years*, an annuity to be entered upon at the end of n years, the first payment of which is not due until the end of the $(N_{x+1})^{\text{th}}$ year. According to this definition, the annuity referred to in the example would be termed an annuity deferred for 29 years, though perhaps more popular notions would lead us to consider it as deferred for 30 years.

In all farther reference to this subject in these volumes, we shall, however, understand that by *an annuity deferred for n years*, is meant an annuity of which the *first payment* is to be made *at the end of n years*, which will, of course, leave an interval of one year only between the last payment of premium and the first payment of the annuity.

This view of the subject strictly adhered to, would naturally lead us to term

the *Immediate Annuity*, an annuity deferred for *one year*. But such an annuity being usually purchased by a price paid down, *Immediate Annuity* is the most natural and therefore the preferable term for it, and there is little chance of its ever being known under any other name. If the first payment, however, had been deferred for *another year*, such an annuity, instead of being considered as deferred for one year, according to the common understanding, might with more propriety be termed an annuity *deferred for two years*, since a payment is not made until the end of that time. The increase of the interval still more favours this view of the matter, and leads to the conviction that the *Deferred Annuity*, considered in this light, is more correctly defined when the date of expiration of the deferred period and that of the first payment are understood to agree.

PROBLEM II.

To construct a Scale of Single and Annual Premiums for an Assurance of £1 payable at death or on the attainment of a given age—sometimes termed an Endowment Assurance.

This kind of assurance is evidently a compound of a temporary assurance and an endowment, depending upon the happening of either of two opposite events. Hence, if a scale of premiums for each of these classes of risks were already computed, our object would be gained by adding them together, and thus forming at once the required scale.

Endowment policies at advanced ages are in frequent request in practice. Not so, however, short period assurances for a longer term than seven or ten years, except in connection with such endowments. Hence the general practice of Insurance Offices is to publish scales of premiums covering both contingencies.

In exhibiting the mode of constructing such scales, we shall assume 60 as the age at which the policy is to become payable, provided it has not been previously paid by the failure of the life.

The formula for the *Single Payment* is here, No. 5 ;

$$\text{or } \frac{M_x + D_{x+n} - M_{x+n}}{D_x}$$

from the numerator of which it appears that the value of all the payments that can be made by an Insurance Office will be the sum of C_x from any given age up

$\lambda N_x \dots 60$ (Fig. 7) for λD_x (Fig. 11), and subtract as before. The difference will be the log. Annual Premiums, and the natural numbers the annual premiums of the scale.

In isolated cases of this kind of assurance, a very good formula for the single payment is

$$* \frac{1 - \rho a_{x|n-1}}{1 + \rho}$$

Where $a_{x|n-1}$ is the value of an annuity on the given life for a term of years less by one than the time to run till the assurance becomes payable. The value of $a_{x|n-1}$ having been ascertained, the annual premium may then be found by dividing the single payment by $1 + a_{x|n-1}$

PROBLEM III.

To construct a Table showing the Value of Policies of Assurance for £1, which have run any given number of years, for every age of entry.

On referring to the list of formulæ, we have under No. 46 a choice of three excellent methods, by any one of which a table may readily be computed, while the number of figures expended in the operation in each case will be found about equal. The first is derived from Milne's well-known formula—

$$A_{x+n} - p_x \times \overline{1 + a_{x+n}} = \text{Value of Policy.}$$

This formula being founded on the difference between the value of the obligations of the contracting parties, and therefore, at first sight, the most intelligible, we shall begin with it, the auxiliary tables necessary for the construction being XVIII., XXXI., and XXXIII.

The columns A_x , log. Annual Premium, and $\lambda \overline{1 + a_x}$ from these tables should be written on slips at the given rate of interest (which we shall assume to be 3 per cent.)

Then, if the table is to show the value of policies that have run 10 years, the arrangement for its computation will be as follows:—

* Assurance Magazine, vol. i. p. 332. See also "Gray's Tables of Life Contingencies," p. 95. art. 233.

Lay the slips $\lambda 1 + a_x$ and log. premium (λp_x) together on a flat board, the former being 10 steps higher up than the latter, and a blank slip marked log. Value of Future Premiums at the right side of these. A weight being now placed on the top, the two slips are added together, and the sums put on the blank slip, as in Fig. 12.

FIG. 12.
First Method.

C 3 $\lambda 1 + a_x$	C 3 λp_x	10 Log. Value Fut. Prem.	10 Value of Fut. Prem.	C 3 A_x	10 Value of Policy.
Age 10.	Age 0.	Age 0.	Age 0.	Age 10.	Age 0.
* *	* *	* *	* *	* *	* *
* *	* *	* *	* *	* *	* *
1.835 7829	8.123 1670	9.458 9499	.28 770 66	.36 894 54	.08 123 88
1.331 2861	8.133 5691	9.464 8552	.29 164 54	.37 544 57	.08 380 03
1.326 5943	8.143 5556	9.470 1498	.29 522 27	.38 215 68	.08 693 41
1.321 8465	8.153 5517	9.475 3982	.29 881 21	.38 887 43	.09 006 22
1.317 2702	8.163 7737	9.481 0439	.30 272 20	.39 528 03	.09 255 83
1.312 9584	8.174 2293	9.487 1877	.30 703 48	.40 125 41	.09 421 93
1.308 5481	8.184 9265	9.493 4746	.31 151 19	.40 730 39	.09 579 20
1.303 9562	8.196 0814	9.500 0376	.31 625 51	.41 353 77	.09 728 26
1.299 0923	8.207 5016	9.506 5939	.32 106 57	.42 006 88	.09 900 31
1.293 9382	8.219 1970	9.513 1352	.32 593 81	.42 691 08	.10 097 27
1.288 5547	8.231 1792	9.519 7339	.33 092 83	.43 397 11	.10 304 28
1.282 9265	8.243 2610	9.526 1875	.33 588 26	.44 125 89	.10 537 63
1.277 1204	8.255 6473	9.532 7677	.34 101 05	.44 867 92	.10 766 87
1.271 1257	8.267 9627	9.539 0884	.34 600 98	.45 623 69	.11 022 71
1.264 9311	8.279 6349	9.544 5660	.35 040 16	.46 393 80	.11 353 64
1.258 6953	8.290 4611	9.549 1564	.35 412 48	.47 158 02	.11 745 54
* * *	* * *	* * *	* * *	* * *	* * *

These sums are then the log. Values of the Future Premiums for every age at entry, when the 11th premium is due but not paid, the natural numbers to which will be the values themselves. When the natural numbers have been obtained, and the previous slips removed, the slip A_x containing the values of the assurance, or of the obligation by the Assurance Office, should next be placed alongside of the values of the future premiums, but 10 steps higher up, as the lives assured will then be 10 years older. Then, if a

blank slip is placed at the right side, so as to run straight with that on the left marked "Value of Future Premiums," the difference of these slips being placed thereon will give the values of the policies. The ages marked are the ages at entry, or when assured.

As policies are seldom effected at an earlier age than 15 years, the table has accordingly been commenced at that age.

Another and perhaps a better method of constructing a scale of the values of policies, is that founded upon Mr. Davies' formula, viz.,

$$1 - \frac{1 + a_{x+n}}{1 + a_x} = \text{Value of Policy.}$$

Two slips of $\lambda \overline{1 + a_x}$ (Table XXXIII.), are laid together on a flat board, one being ten steps higher up than the other, corresponding to the number of years the policy has run. A blank slip is then placed at the right side, so as to run straight with the slip lowest down, $\lambda \overline{1 + a_x}$. The latter is then subtracted from the other slip, and the difference placed on the blank slip marked $\lambda \frac{1 + a_{x+10}}{1 + a_x}$. The natural numbers to these having been got and put down on the next slip, marked $\frac{1 + a_{x+10}}{1 + a_x}$ it only remains to subtract each figure thereon from 9, and the right hand figure from 10, which being done, and the differences placed on a blank slip, the column of results will be the table required, showing the values of policies for £1 which have run ten years, as in Fig. 13.

FIG. 13.
Second Method.

C 3 $\lambda \overline{1 + a_x}$		C 3 $\lambda \frac{1 + a_{x+10}}{1 + a_x}$		C 3 $\frac{1 + a_{x+10}}{1 + a_x}$		C 3 Value of Policy.	
*	*	*	*	*	*	*	*
*	*	*	*	*	*	*	*
1.372 5803	1.335 7829	9.963 2026	.91 876 10	.08 123 90	15		
1.369 2960	1.331 2861	9.961 9901	.91 619 96	.08 380 04			
1.366 0920	1.326 5943	9.960 5023	.91 306 62	.08 693 38			
1.362 8347	1.321 8465	9.959 0118	.90 993 80	.09 006 20			
1.359 4515	1.317 2702	9.957 8187	.90 744 16	.09 255 84			
1.355 9354	1.312 9584	9.957 0230	.90 578 06	.09 421 94	20		
1.352 2797	1.308 5481	9.956 2684	.90 420 82	.09 579 18			
1.348 4043	1.303 9562	9.955 5519	.90 271 74	.09 728 26			
1.344 3692	1.299 0923	9.954 7231	.90 099 64	.09 900 36			
1.340 1652	1.293 9382	9.953 7730	.89 902 74	.10 097 26			
1.335 7829	1.288 5647	9.952 7718	.89 695 74	.10 304 26	25		
1.331 2861	1.282 9265	9.951 6404	.89 462 36	.10 537 64			
1.326 5943	1.277 1204	9.950 5261	.89 233 12	.10 766 88			
1.321 8465	1.271 1257	9.949 2792	.88 977 30	.11 022 70			
1.317 2702	1.264 9311	9.947 6609	.88 646 36	.11 353 64			
1.312 9584	1.258 6953	9.945 7369	.88 254 50	.11 745 50	30		
*	*	*	*	*			

A table of the values of policies may also be computed from two slips of $\lambda \overline{1 - a_x}$ from Table XXXIV., by a process in every respect identical with that just described. But whatever method be adopted, we should bear in mind that a full table showing the values of policies which have run every term of years, will be much more expeditiously computed by completing each set of values

in their order, than by going through the whole of the processes just described for each term of the policy's duration. Thus, by the "first method" (Fig. 12), we should compute "Log. Value of Future Premiums" for every term of the policy's duration, before getting the natural numbers; the next step is of course to get the natural numbers to these logs. from a table of logarithms, and the last step is to subtract each slip marked "Value of Future Premiums" from the slip marked " A_x ," the latter being moved upwards such number of steps as is indicated by the number placed on the top of the former. In the example, the number 10 is placed at the top of the slip, marked "Value of Future Premiums," to denote that the age at valuation is 10 years greater than when the premium for the assurance was fixed, and hence, in subtracting that column from A_x , Age 0 is placed opposite Age 10 of the slip A_x .

The same remarks will apply also to the second method. A full set of slips marked $\lambda \frac{1+a_x+n}{1+a_x}$ should be computed for every duration of a policy from 1, 2, 3, etc. years, marking the slip at the top accordingly; the natural numbers to these should next be got, taking care always to mark the slips with the proper number at the top, and lastly, the columns containing the values of policies are obtained in succession by subtracting each line from 1, as in the example, thus completing the table.

By any of these methods just described, a table may be constructed showing the values of policies which have run from 80 to 100 years, for every age at entry within the proper range, in an incredibly short time by persons who have been trained to this method of computation. Thus, by either method, three separate sets of calculations must be produced before the Table is complete, each set consisting of from 40 to 50 slips, according to the extent of the table to be formed. Allowing therefore one week for the computation of each set, and one week over the whole for comparison of the computer's work, a full table of the values of policies may be computed in one month at any given rate of interest.

Having now shown how a table of the values of whole life policies paying uniform rates of premium may be constructed from $\lambda \overline{1+a_x}$, Table XXXIII., and $\lambda \overline{1-A_x}$, Table XXXIV., it may not be out of place here to give an example showing the utility of these tables in finding the values of such policies in isolated cases,—it being always understood, however, that the premium payable under the policy is according to the Carlisle basis of mortality, and the rate of interest as denoted by the table quoted.

Ex. 1. Required the present value of a policy for £1000 effected 13 years ago, on a life then aged 29 years, the 14th premium being just due. Interest $3\frac{1}{2}$ per cent.

Solution by Table XXXIII.

$29 + 13 = 42$ present age. Hence

$$\lambda \overline{1 + a_{42}} = 1.220\ 5588$$

$$\lambda \overline{1 + a_{29}} = 1.285\ 3950$$

$$\underline{9.935\ 1638} = .8613186$$

$$\therefore \text{Value of a policy of } \pounds 1 = \underline{.1386814}$$

1000

$$\text{Value of a policy for } \pounds 1000 = 138.6814 = \pounds 138 : 13 : 7$$

Ex. 2. Required the value of the same policy at the end of 14 years, when the 15th premium is just due. Interest $3\frac{1}{2}$ per cent.

$29 + 14 = 43$ present age. Hence

$$\log. \overline{1 + a_{43}} = 1.214\ 8315$$

$$\text{colog. } \overline{1 + a_{29}} = 8.714\ 6050$$

$$\text{By addition, } \underline{9.929\ 4365} = .8500344$$

$$\therefore \text{Value of a policy for } \pounds 1 = .1499656$$

1000

$$\text{Value of a policy for } \pounds 1000 = 149.9656 = \pounds 149 : 19 : 4$$

Ex. 3. Required the value of the same policy at the end of 13 years and 7 months from the date of assurance. Interest $3\frac{1}{2}$ per cent.

Value of a policy for £1 at the end of the 13th year = .1386814 Ex. 1.

Table XX. Add Annual Premium, Age 29 . . . = .0180164 p. 46.

Sum = Value at the *beginning* of the 14th year . . . = .1566978

Value at the *end* of the 14th year . . . = .1499656 Ex. 2.

Diff. = Fall in value during the 14th year . . . = .0067322

$\frac{7}{12}$ thereof, being proportion for unexpired time = .0028051

Add value at the end of the 14th year . . . = .1499656 Ex. 2.

Value at the end of 13 years and 7 months . . . = .1527707

1000

$$\therefore \text{Value of } \pounds 1000 = \pounds 152.7707 = \pounds 152 : 15 : 5$$

Ex. 4. Required the value of a policy which has run 17 years, the age at the date of assurance being 34. Interest 4 per cent.

Solution by Table XXXIV.

$34 + 17 = 51$ present age. Hence

$$\overline{\lambda 1 - A_{51}} = 9.717\ 4725$$

$$\overline{\lambda 1 - A_{34}} = 9.821\ 0454$$

$$\underline{9.896\ 4271} = .7878202$$

$$\therefore \text{Value of a policy for } \pounds 1 = .2121798$$

Ex. 5. Required the value of a policy for £1000 effected 25 years ago on a life then aged 32, and which has now bonus additions allocated to it amounting to £452 : 10s. Interest at 6 per cent.

Solution by Table XXXIV.

$32 + 25 = 57$ present age. Hence

$$\log. \overline{1 - A_{57}} = 9.753\ 9988$$

$$\text{colog. } \overline{1 - A_{32}} = 0.105\ 3924$$

$$\text{By addition, } \underline{9.859\ 3912} = .7234212$$

$$\text{Value of a policy for } \pounds 1 = .2765788$$

1000

$$\text{Value of } \pounds 1000 \text{ policy} = 276.5788$$

$$\text{Table XVIII., } A_{57} = .4324569$$

$$\therefore \text{Value of bonus} = .4324569 \times 452.5 = 195.6867$$

$$\text{Total value of the policy} = \pounds 472.2655 = \pounds 472 : 5 : 4$$

We might exemplify the construction of Office Tables to a much larger extent than has been done, if such had been the design of the present work. The specimens given bear reference to that class of Tables most generally in use by Insurance Offices, and it is hoped they will be found to indicate with sufficient distinctness the mode of procedure in constructing according to this system any other class of Tables that may be desired.

A specimen might have been given of the construction of *increasing and decreasing scales of premiums*; but the method to be followed will be rendered sufficiently plain, we trust, from the following isolated examples.

It is necessary, in the first place, to point out an error on the part of the writer of article No. 257, under this head, in the late Mr. David Jones' Treatise "On the Value of Annuities and Reversionary Payments." In that work the article on "INCREASING AND DECREASING SCALES OF PREMIUMS" begins as follows:—

"257. Suppose the annual premium to increase or decrease a certain sum every t years, and at the end of v intervals of t years each, the premium to continue constant during the remainder of life. What annual premium should be required during the first t years?"

"Let p = the annual premium required.

q = the increase or decrease per £1 every t years.

$$A_m = p(1 + a_m) \pm q(a_{(m)t-1} + a_{(m)2t-1} + a_{(m)3t-1} + \dots + a_{(m)vt-1})$$

"by transposition and division,

$$p = \frac{A_m \mp q(a_{(m)t-1} + a_{(m)2t-1} + a_{(m)3t-1} + \dots + a_{(m)vt-1})}{1 + a_m}$$

"By substitution in the first equation,

$$\frac{M_m}{D_m} = p \cdot \frac{N_{m-1}}{D_m} \pm q \left(\frac{N_{m+t-1} + N_{m+2t-1} + N_{m+3t-1} + \dots + N_{m+vt-1}}{D_m} \right)$$

"from which we obtain

$$p = \frac{M_m \mp q(N_{m+t-1} + N_{m+2t-1} + N_{m+3t-1} + \dots + N_{m+vt-1})}{N_{m-1}}$$

In the fundamental equation given above, the right hand side can only express the value of A_m , when p multiplies the whole of that side. For, the premium for the first t years being p , its value for the whole of life is $p(1 + a_m)$, and

the *increase* or *decrease*, at the end of every t years being $p \times q$, its value is evidently

$$p \times q \left(a_{(m)_1t-1} + a_{(m)_2t-1} + a_{(m)_3t-1} + \dots + a_{(m)_vt-1} \right)$$

The writer of the article has not adverted to this, and in the example which follows the rule, there is a misconception as to the value of q , where it is made equal to .002 in place of $= .2$, the increase per pound as assumed.

The equation and solution should have stood thus:—

$$A_m = p \left[(1 + a_m) \pm q (a_{m_1t-1} + a_{m_2t-1} + a_{m_3t-1} + \dots + a_{m_vt-1}) \right]$$

by transposition and division.

$$p = \frac{A_m}{1 + a_m \pm q (a_{m_1t-1} + a_{m_2t-1} + a_{m_3t-1} + \dots + a_{m_vt-1})}$$

By substitution in the first equation,

$$\frac{M_m}{D_m} = p \cdot \frac{N_{m-1} \pm q (N_{m+t-1} + N_{m+2t-1} + N_{m+3t-1} + \dots + N_{m+vt-1})}{D_m}$$

from which we obtain

$$p = \frac{M_m}{N_{m-1} \pm q (N_{m+t-1} + N_{m+2t-1} + N_{m+3t-1} + \dots + N_{m+vt-1})}$$

In order to assimilate the above to our notation, assume n the number of years in each interval instead of t , r the number of intervals instead of v , and x as the age of the proposed life; then adapting the formula to column N_x of this work, the above value of p will stand thus:—

$$p = \frac{M_x}{N_x \pm q (N_{x+n} + N_{x+2n} + N_{x+3n} + \dots + N_{x+rn})}$$

Where the *positive* sign of q is to be used when the scale to be formed is an *increasing* one, and the *negative* sign when *decreasing*. In the following examples, the first is that given by Mr. Jones under art. 257, in which the increase of 4s. is understood to mean the *increase per pound* as originally assumed.

Ex. 6. "What annual premium should be required during the first five years to insure £100 on a life aged 31, the annual premium to increase 4s. every 5 years, and remain constant at the end of 20 years?—(Carlisle 4 per cent.)"

Here $x = 31$, $n = 5$, $r = 4$, and $q = \frac{1}{5}$

Hence $M_{31} \times 100 = 52823.47 = \text{Value of numerator.}$

Also

$$N_{31} \quad . \quad . \quad . \quad . \quad . \quad = 29314.8901$$

$$N_{36} = 21797.0406$$

$$N_{41} = 15933.8352$$

$$N_{46} = 11414.2177$$

$$N_{51} = 7962.2360$$

$$\underline{57107.3295}, \frac{1}{5} \text{ of which is } = 11421.4659$$

$$\therefore \text{Divisor} = \underline{40736.3560}$$

$40736.356 \overline{) 52823.475} (1.29671 = \text{£1 : 6s. per cent} = \text{the first premium.}$

$$\underline{40736 \ 356}$$

$$12087 \ 119$$

$$8147 \ 271$$

$$\underline{3939 \ 848}$$

$$3666 \ 272$$

$$\underline{273 \ 576}$$

$$244 \ 418$$

$$\underline{29 \ 158}$$

The increase is therefore 4s. per pound, or $\frac{1}{5}$ part of the first premium at the end of each 5 years.

The first premium is stated by Mr. Jones to be £1 : 8 : 3, which, if increased by 4s. each 5 years, will make the scale too low.

Ex. 7. If the scale proposed had been *decreasing*, instead of increasing, all other conditions being the same, i.e., if q had been negative, then the divisor would have been

$$29314.8901 - 11421.4659 = 17893.4242$$

and the first period premium $= \frac{52823.475}{17893.4242} = 2.952 = \text{£2 : 19 : 1}$

$$\frac{2.952}{5} = .5904 = 11\text{s. 9d. Quinquennial decrease for 4 periods, making the scale}$$

1st 5 years.
£2 : 19 : 1

2d 5 years.
£2 : 7 : 4

3d 5 years.
£1 : 15 : 7

4th 5 years.
£1 : 13 : 10

Remainder of Life.
£0 : 12 : 1

Ex. 8. Required the annual premium for the first 5 years to insure £100 a life aged 32, the annual premium to receive an addition of $\frac{1}{5}$ th part at the end of each of three periods of 5 years, and thereafter to remain constant. Interest 3 per cent.

Here the formula is
$$p = \frac{M_x}{N_x + q(N_{x+n} + N_{x+2n} + N_{x+3n})}$$

where $q = \frac{1}{5}$, $n = 5$, and $r = 3$.

SOLUTION.

$$N_{32} = 43224.7988$$

$$N_{37} = 33295.4660$$

$$N_{42} = 25178.9411$$

$$N_{47} = 18633.0557$$

$$S = \frac{77107.4628}{5}, \frac{1}{5} \text{ of which} = 15421.4926$$

$$\therefore \text{Divisor} = 58646.2914$$

$$\therefore \frac{M_{32} \times 100}{58646.2914} = \frac{88775.236}{58646.2914} = 1.51374 \text{ first premium.}$$

one-fifth of which is .30275, the periodical increase.

Hence the scale is

1st 5 years.	2d 5 years.	3d 5 years.	Remainder of Life.
1.51374	1.81649	2.11924	2.42299

In this way we may form as many scales as we please, increasing by any other ratio according to the value given to q .

Thus :—

	N_{32}	$q \times S$	Divisors.	Premium for 1st Period.
$q = \frac{1}{5}$, then	43224.80	+ 9638.43	= 52863.23	$\therefore 1.67934$
$q = \frac{1}{6}$, „	43224.80	+ 12851.24	= 56076.04	$\therefore 1.58312$
$q = \frac{1}{8}$, „	43224.80	+ 15421.49	= 58646.29	$\therefore 1.51374$
$q = \frac{1}{4}$, „	43224.80	+ 19276.87	= 62501.66	$\therefore 1.42037$
$q = \frac{1}{3}$, „	43224.80	+ 25702.49	= 68927.29	$\therefore 1.28796$
$q = \frac{1}{2}$, „	43224.80	+ 38553.23	= 81778.03	$\therefore 1.08556$

From these results, it appears that the greater the value which is given to q , the smaller the first premium necessarily becomes; so that by assuming a high value for q , there is a danger of making the first premium so small that it will be insufficient to cover the risk for the first term. Thus, when $q = \frac{1}{4}$, the annual premium for the first five years becomes so small, as to be very little more than the annual premium for a five years' insurance, which will be found to be .99229 per cent. This should be guarded against.

Ex. 9. Required the annual premium for the first five years to insure £100 on a life aged 27, the annual premium to be reduced by $\frac{1}{4}$ th part at the end of each of three periods of five years, and thereafter to remain constant. Interest at $3\frac{1}{2}$ per cent.

Here the formula is

$$P = \frac{M_x}{N_x - q(N_{x+n} + N_{x+2n} + N_{x+3n})}$$

where $q = \frac{1}{4}$, $n = 5$, and the number of intervals 3.

Hence,

$$\begin{aligned} N_{27} &= 45018.658 \\ N_{32} &= 34502.827 \\ N_{37} &= 26077.417 \\ N_{42} &= 19354.899 \\ S &= \underline{79935.143}, \frac{1}{4} \text{ of which is } = \underline{19983.786} = -q \times S. \\ \therefore \text{Divisor} &= \underline{\underline{25034.872}} \\ \therefore \frac{M_{27} \times 100}{25034.872} &= \frac{76593.586}{25034.872} = 3.05947. \end{aligned}$$

which is the premium for the first 5 years.

Hence $\frac{3.05947}{4} = .71487$ decrease at the end of each quinquennial period.

The scale required is therefore—

1st 5 years.	2d 5 years.	3d 5 years.	Remainder of Life.
£3 : 1 : 2	£2 : 6 : 11	£1 : 12 : 7	£0 : 18 : 4

Ex. 10. Suppose the number of intervals or quinquennial periods to be four in place of three, the other conditions being the same. In this case we have only to add N_{47} to the sum of the three deferred annuities in the last example, and the whole becomes

$$N_{37} = 45018.658$$

$$\text{Ex. 9. } S = 79935.143$$

$$N_{47} = 14062.808$$

$$\hline 93997.951, \frac{1}{4} \text{ of which} = 23499.488$$

$$\hline \text{Divisor} = 21519.170$$

$$\therefore \frac{76593.586}{21519.17} = 3.55932, \text{ the premium for the first period. The quinquennial}$$

reduction being one-fourth part, the scale is therefore

1st Period of 5 years.

£3 : 11 : 2

2d Period of 5 years.

£2 : 13 : 5

3d Period of 5 years.

£1 : 15 : 7

4th Period of 5 years.

£0 : 17 : 9

which exhausts the premiums, while the insurance still subsists, and is payable at death, without further premium.

In framing Decreasing Scales of Premiums which are intended to continue for the whole of life, care must be taken to fix the value of q such, that it may be less than $\frac{1}{r}$, that is, less than the reciprocal of the number of intervals, otherwise the premiums will be exhausted in rn years. If they are intended to be so exhausted, then q must be equal to $\frac{1}{r}$ as in the above example.

CONSTRUCTION OF THE COMMUTATION TABLES FOR JOINT ANNUITIES.

An annuity which depends on the joint existence of two or more lives from year to year, is termed a Joint Annuity; and if a course of reasoning were adopted similar to that used for single lives, it might be easily shown that the value of a Joint Annuity on two given lives (x) and (y) is equal to the sum of the combinations of all sorts alive at the *end of each year* discounted from the time each payment falls due, divided by the number of combinations commenced with.

On this principle the value of the Joint Annuity will be denoted by

$$\frac{v \cdot l_{x+1} \cdot l_{y+1} + v^2 \cdot l_{x+2} \cdot l_{y+2} + v^3 \cdot l_{x+3} \cdot l_{y+3} + \&c.}{l_x \cdot l_y}$$

and by multiplying numerator and denominator by v_x , the value will be

$$\frac{v^{x+1}l_{x+1} \cdot l_{y+1} + v^{x+2}l_{x+2} \cdot l_{y+2} + v^{x+3} \cdot l_{x+3} \cdot l_{y+3} + \&c.}{v^x l_x \cdot l_y}$$

This form of expression may be made more suitable for the construction of Joint Commutation Tables, by multiplying together the factors v^x and l_x ; thus—

$$\frac{D_{x+1} \cdot l_{y+1} + D_{x+2} \cdot l_{y+2} + D_{x+3} \cdot l_{y+3} + \&c.}{D_x \cdot l_y} = D_{x,y}$$

In the above formula for the computation of the Joint Annuity, the function D_x is assumed to have been already formed for single lives. If not, it is easily formed for the purpose, but once done, we have only to multiply it by l_y for every value of x and y , and divide the sum of the products, as above shown, by $D_x \cdot l_y$ for the value of the annuity. But when a full Table is to be constructed, the multiplication of D_x and l_y will have to be performed for every difference of x and y , the result being the Joint Commutation Column $D_{x,y}$ for all ages.

FIG. 14.
Formation of Col. $D_{x,y}$
for difference of 5 years.

C	3		
D_x			
10 000.0000			
8 214.5631			
7 332.4536			
6 656.7404			
6 217.6324			
5 863.1519			
5 591.0449			
5 361.5254			
5 159.5788			
4 976.3438			
4 806.8467			
4 645.8912			
4 488.8312			
4 336.2981			
4 188.1813			
4 043.7303			
3 901.6482			
3 762.5973			
3 627.7491			

C	3		
l_y			
10 000			
8 461			
7 779			
7 274			
6 998			
6 797			
6 676			
6 594			
6 536			
6 493			
6 460			
6 431			
6 400			
6 368			

	5		
C	3		
$D_{x,y}$			
58 631 519.			
47 305 831.			
41 707 306.			
37 530 776.			
34 824 454.			
32 672 137.			
31 015 970.			
29 599 353.			
28 342 044.			
27 193 861.			
26 122 498.			
25 091 499.			
24 080 623.			
23 101 506.			

The multiplication of D_x and l_y in constructing the Joint Commutation Tables, Vol. I., was effected thus :—

The slips containing these values were placed together as in Fig. 14, the slip D_x being as many steps higher up as corresponded to the difference of age. A blank slip was at the same time placed at the right hand to receive the products as they were found. A weight was then as usual placed on the top, and the multiplication of the numbers in a line with each other was carried on by two persons on scroll paper, and the results transferred to the blank slip after they had been compared. The example given shows the construction of $D_{x,y}$ for difference of age 5 years. When this column was completed, col. D_x was moved upwards one step, and another blank slip placed at the right hand, in order that col. $D_{x,y}$ for difference of age 6 years might be computed in a similar manner; and this process was carried on until the

full number of 53 columns were completed. On this being done, they were read over with the work on the scroll paper, by three persons, before they were

summed up, in order to lessen the chance of error in the formation of the N column.

Both of the columns were likewise subjected to two readings while the work was passing through the press; but from the care which had been bestowed on them when computing, the corrections were in general trifling, while the readings afforded farther proof of the accuracy with which the tables had been got up.

The D and N columns for Joint Lives thus formed, being identical in construction with the Preparatory Tables of Mr. Jones on the Carlisle basis, the two sets of tables were carefully read over together, and the differences discovered in the comparison being noted down, are given in a list appended to Vol. I. These differences appear to be errors in Mr. Jones' tables, and should therefore be corrected with the pen.

PART II.

ON SUCCESSIVE LIVES.

The doctrine of Successive Lives has been variously treated by different authors, from time to time, and even rendered somewhat obscure by the investigations of the earlier writers. More recently, however, by the writings of Professor de Morgan, Mr. Peter Gray, and others, the subject has been freed from much of the misconception which formerly prevailed, and is now presented by them in a more intelligible form. But Mr. Gray has treated it so differently from any of the others, and has, with his usual ability and perspicuity of style, investigated it so fully, that nothing farther could be desired to put the matter into good working order than the rules which he has laid down in his two admirable papers,* from which the following extracts are taken.

Besides the simplicity of his method, the practice of it has only been rendered the more attractive by the peculiarity of the resulting formulæ, which, as he himself remarks, “consist in almost every case of a single continued product of quantities, all of which are or may very easily be tabulated once for all. They are hence singularly adapted to logarithmic computations.”

It will not seem surprising, therefore, though we should find that a method so perfect in its form should soon become very generally practised. Indeed the logarithmic process on which its calculations are based gives to it a highly commendatory, because simple, character; and it is this peculiar feature about it that has led the author of the present work to refer to the subject in this place, in the belief that by the addition of Table XXXIV. to the list, he would be conferring a benefit upon the profession generally, by affording the means of practising Mr. Gray’s method more extensively.

I am aware that it is not doing justice to the able author of the papers to present them here in a mutilated form, and as the substance of them only could be given here, they should therefore be read entire by every one who is desirous

* “On the Doctrine of Successive Lives.” By Peter Gray, Esq., F.R.A.S. Assurance Magazine, vol. ii.

of thoroughly understanding the subject. This is the more necessary, as Mr. Gray has added a new problem, whereby he gives rules for finding the value of the interest of each tenant in an advowson, when it is held by two or more tenants in common, who present successively. This is a valuable addition to the stock of information on the subject; and though such cases may not be so numerous as others of a more simple character, the problem is nevertheless of great importance.

After a few introductory remarks and explanation of general terms, Mr. Gray begins with the following lemma:—

It is required to determine the relation that subsists between the present value of an annuity on any given status,* and that of an assurance on the same status.

Let the present value of the annuity be denoted by a , and that of the assurance by A . The annuity upon the given status, and a perpetuity due to be entered upon at the end of the year in which that status fails, will evidently together compose a perpetuity commencing immediately. The present value of this perpetuity is P , that of the annuity is a , and the perpetuity due *at the time of its being entered upon*, will be worth $1 + P$. Hence $P - a$ is the present value of an assurance of $1 + P$ upon the given status. That is—

$$P - a = A (1 + P)$$

Whence we obtain

$$A = \frac{P - a}{1 + P}$$

and

$$a = P - (1 + P) A$$

Adding unity to both sides of the last equation, we obtain

$$1 + a = 1 + P - (1 + P) A = (1 + P) (1 - A)$$

and

$$1 - A = \frac{1 + a}{1 + P}$$

The above equation therefore became the foundation of Table XXXIV., which was formed thus:—

* By the term *status*, as used in connection with this subject, is meant "the state or condition of things, during the continuance of which an annuity is to be paid," † or, on the cessation or dissolution of which a sum assured is to be paid. Thus a status may be the duration of a specified term of years, the duration of a single life, the joint duration of two or more lives, the duration of the longest survivor of any given number of lives; or, in fine, either the joint duration, or the longest duration of any two or more of the foregoing or similar "states of things."—GRAY.

† De Morgan on Probabilities (Lardner's Cyclopædia, p. 190).

Log. $(1 + a)$ being equal to log. $N_x + \text{colog. } D_x$, and having been previously obtained thereby, colog. $(1 + P)$ was written on a small piece of paper, and added to log. $(1 + a)$ from Age 0 to Age 104, the result being log. $(1 - A)$ as given in Table XXXIV.

Mr. Gray then proceeds to solve the following problem :—

I. A perpetual annuity of £1 is now enjoyed by an individual of a given age. On the failure of the life at present in possession, a successor in the enjoyment of the annuity is to be nominated; and on the failure of this first succeeding life, a second, and so on for ever, subject to the conditions that each nomination is to be made at the end of the year in which the preceding life fails, and that all the lives shall at the periods of their respective nominations, be of given ages. It is required to determine the present value of each succeeding life, or, the sum which ought now to be given for the right of nomination in each case.

* * * * *

When the succeeding lives are to be at nomination all of the same age, x will be employed to denote the age of the life in possession, and y that of the succeeding lives at the time of nomination. a_x and A_x will therefore respectively denote the present value of an annuity and an assurance on the life in possession, and a_y and A_y the same respectively on a life now of the same age that the succeeding lives are to be of at the time of nomination.

But when the succeeding lives are to be of different ages at nomination, we shall employ as suffixes of a and A , the numerals 0, 1, 2, 3, etc., of which the first (namely 0), will belong to the life in possession, and the others to the succeeding lives, in the order of their succession. The suffixes, when so used, will be distinguished by being inclosed in parenthesis. We now return to the problem.

Case 1. When the succeeding lives are to be of different ages at nomination.

Keeping the preceding considerations in view, since $1 + a_{(1)}$ is the value at the time of its being entered upon, of an annuity due on the first succeeding life, the present value of an assurance of this amount on the life in possession, namely,

$$(1 + a_{(1)}) A_{(0)}; \text{ or } (1 + P) (1 - A_{(1)}) A_{(0)}$$

will be the present value of the first succeeding life.

* * * * *

The status which precedes the second life in succession, is the successive duration of the life in possession, and the first succeeding life; and the value of an annuity upon that status is evidently the sum of the present values of annuities upon the lives which compose it. This sum is

$$a_{(0)} + (1 + P) (1 - A_{(1)}) A_{(0)}.$$

Hence, substituting this for a in the formula

$$\frac{P - a}{1 + P}$$

we have for the present value of an assurance of £1 on that status

$$\begin{aligned} \frac{P - a_{(0)} - (1 + P) (1 - A_{(1)}) A_{(0)}}{1 + P} &= \frac{P - a_{(0)}}{1 + P} - (1 - A_{(1)}) A_{(0)} \\ &= A_{(0)} - (1 - A_{(1)}) A_{(0)} = A_{(0)} \cdot A_{(1)}, \end{aligned}$$

and multiplying this by $1 + a_{(2)}$, we have for the value of an assurance of $1 + a_{(2)}$ on the same status, that is, for the value of the second life in succession,

$$(1 + a_{(2)}) A_{(0)} \cdot A_{(1)}; \text{ or } (1 + P) (1 - A_{(2)}) A_{(0)} \cdot A_{(1)}.$$

In like manner the value of an annuity on the status which precedes the third life in succession *will be found*

$$= a_{(0)} + (1 + P) (1 - A_{(1)} \cdot A_{(2)}) A_{(0)}.$$

and substituting this, as before, for a in the formula

$$\frac{P - a}{1 + P}$$

we find for the value of an assurance of £1 on this status

$$A_{(0)} \cdot A_{(1)} \cdot A_{(2)}.$$

Hence the value of an assurance of $1 + a_{(3)}$ upon the same status, that is, of the third life in succession, will be

$$(1 + a_{(3)}) A_{(0)} \cdot A_{(1)} \cdot A_{(2)} \text{ or } (1 + P) (1 - A_{(3)}) A_{(0)} \cdot A_{(1)} \cdot A_{(2)},$$

and similarly the value of an assurance of $1 + a_n$ on the n th life in succession, will be represented by

$$(1 + P) (1 - A_{(n)}) A_{(0)} \cdot A_{(1)} \cdot A_{(2)} \dots A_{(n-1)},$$

which is therefore the general solution of the problem proposed.

All things remaining as before, it is required to determine the total present value of the first n successive lives.

The value here required is evidently the sum of the n terms which arise by making n successively equal to 1, 2, 3 . . . n , in the general expression.

Hence,

$$\begin{aligned}
 \text{For } n = 1 \text{ we have } & (1 + P) (1 - A_{(1)}) A_{(0)} ; \\
 n = 2 \quad , & \quad (1 + P) (1 - A_{(2)}) A_{(0)} \cdot A_{(1)} ; \\
 n = 3 \quad , & \quad (1 + P) (1 - A_{(3)}) A_{(0)} \cdot A_{(1)} \cdot A_{(2)} ; \\
 & \quad \vdots \\
 & \quad \vdots \\
 n = n \quad , & \quad (1 + P) (1 - A_{(n)}) A_{(0)} \cdot A_{(1)} \cdot A_{(2)} \dots A_{(n-1)} .
 \end{aligned}$$

Taking out the factor common to all these expressions, namely, $(1 + P) A_{(0)}$, multiplying out the remaining factors and adding the results (observing that one of the products which appears with the sign *plus* in each expression appears in the next with the sign *minus*), we obtain for the required value

$$(1 + P) (1 - A_{(1)} \cdot A_{(2)} \cdot A_{(3)} \dots A_{(n)}) A_{(0)} .$$

Again :—

If n be supposed infinitely great, then $A_{(1)}$, $A_{(2)}$, etc., being each less than unity, their product vanishes, and the expression—which in this case will denote the value of all the lives to perpetuity—is reduced to

$$(1 + P) A_{(0)} ;$$

Case 2. When the succeeding lives are to be all of the same age at nomination, the value of the n th life in succession will (by substitution in the general expression for the n th life found above, where the ages are different), be

$$(1 + P)(1 - A_x) A_x \cdot A_y^{n-1} .$$

In this expression, as in that from which it is derived, by giving to n any integer value whatsoever, we get the expression for the present value of the life corresponding to that value of n .

Thus :—

If $n = 1$ we have $(1 + P)(1 - A_y) A_x$ for the value of the 1st life ;

$n = 2$ „ $(1 + P)(1 - A_y) A_x \cdot A_y$ „ 2d life ;

$n = 3$ „ $(1 + P)(1 - A_y) A_x \cdot A_y^2$ „ 3d life ;

• • • • •

• • • • •

• • • • •

$n = n$ we have $(1 + P)(1 - A_y) A_x \cdot A_y^{n-1}$ for the value n th life.

And their sum, adding the n th life, will evidently be the value of the first n successive lives, which is,

$$\begin{aligned} & (1 + P)(1 - A_y) A_x (1 + A_y + A_y^2 + A_y^3 + \dots + A_y^{n-1}) \\ &= (1 + P)(1 - A_y) A_x \frac{1 - A_y^n}{1 - A_y} \\ &= (1 + P)(1 - A_y^n) A_x \end{aligned}$$

II. If instead of an annuity, a fine of £1 is to be paid at the end of the year in which each life in possession fails ; that is, at the time of the nomination of the next succeeding life. The value of each fine, when the succeeding lives are of different ages, will be found to be

$n = 1,$	$A_{(0)}$	Value of the first fine.
$n = 2,$	$A_{(0)} \cdot A_{(1)}$	„ second fine.
$n = 3,$	$A_{(0)} \cdot A_{(1)} \cdot A_{(2)}$	„ third fine.
•	•	
•	•	
•	•	
$n = n,$	$A_{(0)} \cdot A_{(1)} \cdot A_{(2)} \dots A_{(n-1)}$	Value n th fine.

And the sum of these expressions, which will be the value of the first n fines, is

$$A_{(0)} + A_{(0)} \cdot A_{(1)} + A_{(0)} \cdot A_{(1)} \cdot A_{(2)} + \dots + A_{(0)} \cdot A_{(1)} \cdot A_{(2)} \dots A_{(n-1)}.$$

Here, each term can be readily deduced from that which precedes it ; but no expression can be assigned for the sum of the terms, which would materially simplify the arithmetical computation.

When the succeeding lives are all of the same age at nomination, the value of the first n fines will evidently be the sum of the series—

$$\begin{aligned} & A_x + A_x \cdot A_y + A_x \cdot A_y^2 + A_x \cdot A_y^3 + \dots + A_x \cdot A_y^{n-1} \\ &= A_x (1 + A_y + A_y^2 + A_y^3 \dots + A_y^{n-1}) \\ &= \frac{A_x (1 - A_y^n)}{1 - A_y} \end{aligned}$$

If the value of all the fines to perpetuity be required, we have for this value, by making n in the expression last deduced infinite, in consequence of which A_y^n vanishes—

$$\frac{A_x}{1 - A_y}$$

By subtracting from the value of all the fines just found, that of the first n fines, we obtain for the value of all the fines after the n th, that is, of the $(n + 1)$ th and following fines, to perpetuity—

$$\frac{A_x - A_x (1 - A_y^n)}{1 - A_y} = \frac{A_x \cdot A_y^n}{1 - A_y};$$

And this expression, by changing n into $n - 1$, becomes—

$$\frac{A_x \cdot A_y^{n-1}}{1 - A_y}$$

which will denote the value of the n th, and following fines, for ever.

The following examples, illustrating the application of the formulæ, are extracted from Part II. of Mr. Gray's paper, containing the praxis, and any obscurity which may be met with must arise entirely from the brevity of the preceding extracts from Part I. of his paper, to which the reader is here referred for fuller information on the subject. The Tables used in the examples are those contained in this work, which are occasionally found to differ from Mr. Gray's in the last place, but the results are not thereby affected.

I.—CHURCH LIVINGS.

Ex. 1. Required the value of the advowson of a living of the net* annual value of £317:10s., the age of the incumbent being 56. Interest at 3 per cent.

Here the value is $(1 + P) A_{56} \times 317.5$

1 + P,	log.	1.5357160	
A_{56} ,	„	9.7930532	
317.5,	„	2.5017437	
6768.820	„	<u>3.8305129</u>	\therefore £6768:16:5 = value required.

Ex. 2. Required the value of the 1st, 2d, 3d, and 4th presentations to the same living, the age of the incumbent being as above, and the common age of the nominees at appointment 24.

The formula here requisite is

$$(1 + P) (1 - A_y) A_x \cdot A_y^{n-1}. \quad (\text{Page xlvii., Case 2}).$$

in which $x = 56$, $y = 24$, and $n = 1, 2, 3, 4$, successively.

1 + P,	log.	1.5357160	
$1 - A_{24}$,	„	9.8044492	
A_{56} ,	„	9.7930532	
$A_{24}^0 = 1$,	„	0.0000000	
317.5,	„	2.5017437	
4314.814,	=	<u>3.6349621</u>	\therefore £4314:16:4 = value of first presentation.
A_{24} ,	log.	9.5593622	
1564.315,	=	<u>3.1943243</u>	\therefore £1564:6:4 = „ second „
A_{24} ,	log.	9.5593622	
567.135,	=	<u>2.7536865</u>	\therefore £567:2:9 = „ third „
A_{24} ,	log.	9.5593622	
* 205.612,	=	<u>2.3130487</u>	\therefore £205:12:3 = „ fourth „
		<u>£6,651:17:8</u>	= „ first four.

* By the *net* annual value is meant the excess of the annual value of the living over that of the services to be performed. Thus, if the annual value were £700, while the services to be performed are held to be worth only £400 per annum, the *net* annual value of the living, and that which alone becomes the subject of calculation, is the £300 of annual excess.

It is here shown that when the value of the first presentation is found, the succeeding values are formed in order by the introduction of the factor A_{24} ; and the sum of the values thus obtained, is the aggregate value of the whole. If, however, the value of a remote presentation only is wanted, it may be obtained without going through all the foregoing process.

Ex. 3. Required the value of the fourth presentation to the above living.

The formula for this case is still the same as in the last example, when $x = 56$, $y = 24$, and $n = 4$.

$$(1 + P) (1 - A_{24}) A_{56} \cdot A_{24}^3.$$

A_{24} ,	log. 9.5593622	
		3
A_{24}^3 ,	= 8.6780866	
$1 + P$,	log. 1.5357160	
$1 - A_{24}$,	„ 9.8044492	
A_{56} ,	„ 9.7930532	
317.5,	„ 2.5017437	
205.612,	= <u>2.3130487</u>	$\therefore \text{£}205 : 12 : 3 = \text{value required.}$

Ex. 4. Required the value of the first four presentations to the foregoing living.

Here the formula is

$$(1 + P) (1 - A_{24}^4) A_{56}. \quad (\text{Page xlviii}).$$

when $x = 56$, $y = 24$, and $n = 4$

A_{24} ,	log. 9.5593622	
		4
$A_{24}^4 = .0172762$,	„ <u>8.2374488</u>	
$1 - A_{24}^4 = .9827238$,	„ 9.9924314	
$1 + P$,	„ 1.5357160	
A_{56} ,	„ 9.7930532	
317.5,	„ 2.5017437	
6651.878	= <u>3.8229443</u>	$\therefore \text{£}6651 : 17 : 7 = \text{value required.}$

Ex. 5. Required the value of the fifth and following presentations for ever.

The formula here is

$$(1 + P) A_{56} \cdot A_{24}^4.$$

when $x = 56$, $y = 24$, and $n = 5$.

$1 + P,$	log.	1.5357160	
$A_{56},$	„	9.7930532	
$A_{24}^4,$	„	8.2374488	Ex. 4.
317.5,	„	2.5017437	
		2.0679617	
$116.9396,$		$=$	$\therefore \text{£}116 : 18 : 10 = \text{value required.}$

The sum of this result, and that of Example 4, is $\text{£}6768 : 16 : 5$, the value of the advowson, as already found in Example 1.

II.—COPYHOLD ESTATES.

The feature in copyhold tenures with which we have to do, is, that they are held of the lord of the manor, subject to the payment to him, not of an annual sum in name of rent, but of a fixed sum at the death of the single tenant, if there be but one, or of each tenant, if there are more than one—a new life being nominated to take the place of each that fails, at the end of the year in which such failure takes place.

The right of nominating new lives, as the lives in possession drop, rests with the copyholders and their heirs; and as it is obviously their interest that the fines to be paid should be as few as possible, it may be fairly assumed, that the life *put in* at each renewal will be the best that the tables afford. The best life by the Carlisle Table is Age 7.

Ex. 1. A copyhold estate is held on a single life, subject to a renewal fine at the decease of each tenant, of $\text{£}1520$. The life now in the lease is 37 years of age, and it is required to determine the present value of the first, second, third, etc., fines.

Here $x = 37$, $y = 7$ (the renewals being always made with lives of 7 years of age), and $n = 1, 2, 3$, etc. We thus have for the value (if the fine is $\text{£}1$)

Of the first fine,	A_{37}
„ second „	$A_{37} \cdot A_7$
„ third „	$A_{37} \cdot A_7^2$

and so on; so that here, as in previous cases, the value of each fine, after the first, is derived from that of the preceding, by the introduction as a factor of A_7 .

$$\begin{array}{rcl}
 1520, & \log. & 3.1818436 \\
 A_{37}, & ,, & 9.6519359 \\
 \hline
 681.992, & = & 2.8337795 \therefore \text{£}681 : 19 : 10 = \text{value of first fine.} \\
 A_7, & \log. & 9.4404864 \\
 \hline
 188.047, & = & 2.2742659 \therefore \text{£}188 : 0 : 11 = \text{value of second fine.} \\
 A_7, & \log. & 9.4404864 \\
 \hline
 51.850, & = & 1.7147523 \therefore \text{£}51 : 17 : 0 = \text{value of third fine.} \\
 & & \underline{\text{£}921 : 17 : 9} = \text{value of first three fines.}
 \end{array}$$

Ex. 2. Required the value of the third fine.

The formula is $A_{37} \cdot A_7^2$. (Page xlix).

$$\begin{array}{rcl}
 A_7, & \log. & 9.4404864 \\
 & & 2 \\
 \hline
 A_7^2, & ,, & 8.8809728 \\
 A_{37}, & ,, & 9.6519359 \\
 1520, & ,, & 3.1818436 \\
 \hline
 51.850, & ,, & 1.7147523 \therefore \text{£}51 : 17s. = \text{value required.}
 \end{array}$$

Ex. 3. Required the value of the first three fines.

$$x = 37, y = 7, \text{ and } n = 3.$$

The value here is (if the fine £1)

$$\begin{array}{rcl}
 & & \frac{A_{37} (1 - A_7^3)}{1 - A_7} \text{ (Page xlix).} \\
 A_7, & \log. & 9.4404864 \\
 & & 3 \\
 \hline
 A_7^3 = .0209633, & = & 8.3214592 \\
 1 - A_7^3 = .9790367, & \log. & 9.9907989 \\
 A_{37}, & ,, & 9.6519359 \\
 1 - A_7, & \text{colog.} & 0.1401005 \\
 1520, & \log. & 3.1818436 \\
 \hline
 921.889 & = & 2.9646789 \therefore \text{£}921 : 17 : 9 = \text{value required.}
 \end{array}$$

Ex. 4. Required the value of all the fines for ever.

The formula here is $\frac{A_x}{A - A_y}$ where $x = 37$ and $y = 7$.

$$\begin{array}{rcl} 1520, & \log. & 3.1818436 \\ A_{37}, & ,, & 9.6519359 \\ 1 - A_7, & \text{colog.} & 0.1401005 \\ \hline 941.629 & \log. & \underline{2.9738800} \therefore \text{£}941 : 12 : 7 = \text{value required.} \end{array}$$

This is the sum which the copyholder might now equitably pay for the conversion of his copyhold into a freehold; and if it be divided by the value of a perpetuity of £1, *i.e.*, by $1 \div r$, or, which is the same thing, multiplied by r (*viz.* .03), we obtain $28.249 = \text{£}28, 5s.$, which is the perpetual annual rent for which the fines might be commuted. It is also the *net* annual premium, in consideration of which an office might undertake to pay the fines as they become due.

Ex. 5. A copyhold estate is held on three lives, each renewable at the end of the year in which it drops, by a life of 7 years of age, on payment of a fine of £3000; the lives at present in the lease are aged respectively 30, 42, and 65 years. It is required to determine the present value of all the fines for ever, and also the equivalent annual payment for which they might be commuted.

By the formula in last example, the value of the fines in respect of (30) and his successors, is

$$\frac{3000 A_{30}}{1 - A_7}$$

the like in respect of (42) and his successors, is

$$\frac{3000 A_{42}}{1 - A_7}$$

and the like in respect of (65) and his successors, is

$$\frac{3000 A}{1 - A_7}$$

hence the total value required is

$$\frac{3000 (A_{30} + A_{42} + A_{65})}{1 - A_7}$$

$$A_{30} = .4012541$$

$$A_{42} = .4862427$$

$$A_{65} = .7111452$$

$$1.5986420, \quad \log. \quad 0.2037512$$

$$3000, \quad ,, \quad 3.4771213$$

$$1 - A_7, \quad \text{colog.} \quad 0.1401005$$

$$6621.750, \quad \log. \quad \underline{3.8209730} \therefore \text{£}6621 : 15s. = \text{value required.}$$

$$.03$$

$$\underline{198.65250} \therefore \text{£}198 : 13s. = \text{annual premium required.}$$

- (1.) *When the life assured is the OLD LIFE against the young life.*
- (2.) *When the life assured is the YOUNG LIFE against the old life.*

These we shall now consider separately.

Let (x) denote the *Old Life*, and (y) the *Young Life*. Also, let l_x and l_y respectively denote the tabular numbers alive at the ages x and y ; and let $d_x, d_y, d_{x+1}, d_{y+1}$, etc. etc. denote the decrements in each class in the first, second, etc., years.

Hence

$l_x \cdot l_y$ = combinations at the beginning of the 1st year.

$l_{x+1} \cdot l_{y+1}$ = combinations at the end of the 1st year.

$l_x \cdot l_y - l_{x+1} \cdot l_{y+1}$ = combinations dissolved,

will be the state of things at the end of the first year, without reference to any particular order of deaths. But in the combinations dissolved, we have to do only with the lives of one class which predecease those of the other class, as payment of the sum assured depends on the number of instances in which this event occurs from year to year. These instances are manifestly equal when the two lives are of the same age, greater when the life assured is the older, and less when the younger of the two given lives.

CASE 1. *To determine the value of an assurance of £1 on the OLD LIFE (x) against the young life (y) .*

The payment of the sum assured during the first year, will depend upon the occurrence of either of two events—(1.) That (x) die during the year, and (y) live to the end of it. (2.) That both die during the year, (x) dying before (y) .

The number of instances in which the first event will occur is evidently $d_x \times l_{y+1}$, and if we assume that the deaths are equally spread throughout the year in both classes of lives, whatever be the difference of age, the number of instances in which the second event will occur, will be, $\frac{1}{2}(d_x \times d_y) = d_x \times \frac{1}{2}d_y$. Hence—

The whole number of instances in which the death of (x) will occur before (y) in the first year, will be the sum of these two products, or

$$\begin{aligned}
& d_x \times l_{y+1} + d_x \times \frac{1}{2}d_y \\
&= d_x \times (l_{y+1} + \frac{1}{2}d_y) \\
&= d_x \times (l_{y+1} + \frac{1}{2}(l_y - l_{y+1})) \\
&= d_x \times \frac{1}{2}(l_y + l_{y+1}) \\
&= d_x \times l_{y+\frac{1}{2}}.
\end{aligned}$$

It thus appears that d_x must be combined with the number alive of class (y) in the middle of the year, and as payment of the sum assured will depend upon the happening of the same events in the second and following years, a similar course of reasoning will show that the number of instances in which this event occurs in the second, third, etc., years, will be $d_{x+1} \times l_{y+\frac{1}{2}}$, $d_{x+2} \times l_{y+\frac{3}{2}}$, etc. Hence the value of the total payments to be made at the end of the first, second, etc., years, will be

$$\begin{aligned}
& vd_x \cdot l_{y+\frac{1}{2}} \text{ for the first year.} \\
& v^2 d_{x+1} \cdot l_{y+\frac{1}{2}} \text{ for the second year.} \\
& v^3 d_{x+2} \cdot l_{y+\frac{3}{2}} \text{ for the third year.} \\
& \text{etc.} \qquad \qquad \text{etc.}
\end{aligned}$$

If these several products be added together, and their sum divided by $l_x \cdot l_y$, the number of combinations at the beginning of the first year, we shall have for the value of an assurance of £1 on the life of (x) against (y) the expression

$$\frac{vd_x \cdot l_{y+\frac{1}{2}} + v^2 d_{x+1} \cdot l_{y+\frac{1}{2}} + v^3 d_{x+2} \cdot l_{y+\frac{3}{2}} + \&c.}{l_x \cdot l_y}$$

By multiplying the numerator and denominator by v^x , it will become—

$$\frac{v^{x+1} d_x \cdot l_{y+\frac{1}{2}} + v^{x+2} d_{x+1} \cdot l_{y+\frac{1}{2}} + v^{x+3} d_{x+2} \cdot l_{y+\frac{3}{2}} + \&c.}{v^x l_x \cdot l_y} = D_{x,y}$$

And if the element v is combined with the column of decrements, the formula will be rendered more convenient for computation, and will become—

$$\frac{C_x \cdot l_{y+\frac{1}{2}} + C_{x+1} \cdot l_{y+\frac{1}{2}} + C_{x+2} \cdot l_{y+\frac{3}{2}} + \&c.}{D_{x,y}}$$

We have now obtained the final result expressing the value of an assurance of

£1 on (x) against (y), which, by summing the numerator, we may denote by $\frac{M_{x,y}^1}{D_{x,y}}$. For this class of assurance Mr. Gray has used the abbreviated symbol $A_{x,y}^1$, which we have adopted here as being the simplest and most natural one.

The expression just obtained is therefore the working formula, the numerator being the only part with which we have to do in constructing the Tables. The numerical results expressing the *sum* of the several products, or the value of $M_{x,y}^1$ for every difference of x and y , are tabulated in Volume II. on the *left hand page*, while the value of the denominator $D_{x,y}$ will be found in Volume I.

It will be observed that of the two factors, C_x and l_{y+t} , the only new one is l_{y+t} , or, as it is given in Table IX, l_{x+t} . When the column l_{y+t} , is combined with another column of younger lives, it is named l_{x+t} ; but when it is combined with a column of *older* lives, it is more appropriately named l_{y+t} , as in Fig. 15.

The two factors C_x and l_{y+t} , with their successive values, should therefore be written on slips in logarithms. The Auxiliary Tables, Volume II., page 541, contain, on the *left hand* page, the logarithms according to the Carlisle basis at the different rates of interest used in this work, and consequently are the foundation of the corresponding values tabulated of the Old Life against the Young Life, as contained in the Second Volume.

The annexed figure will show the mode of procedure in calculating the tables, from which it will be observed that the function $\lambda C_{x,y}^1$ is the first to be obtained.

As the slips now lie, Fig. 15, the calculation is for a difference of age of five years. This is shown by λC_x being placed five free spaces above λl_{y+t} , and the rate of interest is assumed to be 3 per cent. A blank slip is placed at the right hand marked $\lambda C_{x,y}^1$, on which are placed the sums of the other two lying on the same line with itself. The addition of the two slips is commenced at the top. In this way $\lambda C_{x,y}^1$ was obtained in computing the Tables of this work for every difference of

FIG. 15.

Formation of $\lambda C_{x,y}^1$.

C 3		5	
λC_x		C 3	
		$\lambda C_{x,y}^1$	
	3.174 4014		
	2.808 1100		
Carlisle	2.664 7797		
Mortality.	2.389 5602		
λl_{y+t}	2.239 0100		
3.965 2252	2.005 7621	5.970 9873	0
3.909 5560	2.823 9533	6.733 5093	
3.876 5931	2.660 7302	6.537 3233	
3.853 4548	2.517 9335	6.371 3883	
3.838 6917	2.390 1417	6.228 8334	
3.828 4343	2.321 1885	6.149 6228	5
3.821 8409			
* * *	* * *	* * *	
1.423 2459	9.004 4703	0.427 7162	95
1.311 7569	8.991 6331	0.303 3870	
1.204 1200	8.978 7959	0.182 9159	
1.096 9100	8.965 9586	0.062 8686	
1.000 0000	8.952 0914	9.652 0914	99
0.903 0900			
0.778 1513			
* * *	* * *	* * *	

age from the two slips λl_{y+1} and λC_x , the latter being moved upwards as many steps as equalled the difference of age, and the blank slip at the right hand $\lambda C_{x,y}^1$ marked by a figure at the top to indicate that difference. When $\lambda C_{x,y}^1$ had been found for every difference of age by two persons, their work was carefully compared, and the errors, if any, corrected, after which the natural numbers were obtained from a table of logarithms to seven places of figures. These having been got, the work was again compared by reading over, when any farther errors were corrected, as well as those, if any, which happened to be passed over in comparing $\lambda C_{x,y}^1$.

FIG. 16.
Formation of $M_{x,y}^1$ and $R_{x,y}^1$.

5	5	5
C 3	C 3	C 3
$C_{x,y}^1$	$M_{x,y}^1$	$R_{x,y}^1$
935 378.2		
541 388 9		
344 606.3		
235 173.4	6 720 666.9	
169 368.8	6 551 295.1	
141 131.1	6 410 167.0	
144 263.3	6 265 903.7	
143 054.3	6 122 849.4	
	* * *	* * *
* * *		48.612 35
	19.015 69	29.596 66
7.556 73	11.458 96	18.137 70
3.642 30	7.816 66	10.321 04
2.677 42	5.139 24	5.181 80
2.010 88	3.128 36	2.053 44
1.523 76	1.604 60	.448 84
1.155 76	.448 84	
.448 84		
* * *	* * *	* * *

Things being thus prepared, the next step was to sum up the column $C_{x,y}^1$ in the usual manner. But to simplify this, and to lessen the chance of error, the figures in slip $C_{x,y}^1$ were so arranged as to leave a blank space to run down between the third and fourth figures from the decimal point, on both sides. Before beginning to sum up $C_{x,y}^1$ to form $M_{x,y}^1$, the value at the bottom of slip $C_{x,y}^1$ was transferred to the opposite space of the slip $M_{x,y}^1$, and the latter moved upwards *one step*, when a weight was placed upon them to keep them steady. $C_{x,y}^1$ was then summed up in the usual manner to form $M_{x,y}^1$, checking the summation every ten lines as it proceeded in the way pointed out in p. xviii., until it reached the top.

On this being done, the slip $C_{x,y}^1$ was removed, and $R_{x,y}^1$ was formed by summing up $M_{x,y}^1$ in precisely the same way as it was formed by summing up $C_{x,y}^1$.

The columns $M_{x,y}^1$ and $R_{x,y}^1$ were formed in the manner just described for every difference of x and y , and it will at once be perceived that as the difference of age increased the columns shortened, while they were lengthened as the difference diminished. Hence

to preserve the same length for each column, the increasing differences from Age 0 were written on the upper part of each slip, while the diminishing differences from Age 104 were written on the lower part. As each slip, by this arrangement, contained the same quantity of figuring, it became an easy matter, in order to gain an advantage in the press, to place the slips $M_{x,y}^1$ and $R_{x,y}^1$ on one page, and the

corresponding slips of the opposite contingency on the opposite page, as has been done throughout Vol. II., and thus secure the singular facility of obtaining the materials for the joint assurance by inspection of the same folio of tables.

Though the author's object, as already stated, was the production of the M and R columns only, as they are given in Vol. II., it may not be improper to show here how the ultimate results can be obtained from them in a tabular form. On referring to the expression on p. lviii. for the value of an assurance on (x) against (y), it will be observed that the function $M_{x,y}^1$ expresses the numerator of a fraction whose denominator is $D_{x,y}$. The value of this frac-

tion, $\frac{M_{x,y}^1}{D_{x,y}}$, for each pair of ages of the same difference is therefore the result we are seeking for, denoted by $A_{x,y}^1$.

To obtain this we again adopt the logarithmic process. The logarithms of $D_{x,y}$ and $M_{x,y}^1$ for every difference of age are found from tables, and written on slips in the usual way.

Fig. 17 exemplifies the formation of $\lambda A_{x,y}^1$ for difference of age 15 years. The two slips for that difference being selected, are placed together contiguously on a board with a blank slip at the right hand, marked $\lambda A_{x,y}^1$, and a weight on the top. $\lambda D_{x,y}$ is then subtracted from $\lambda M_{x,y}^1$ from top to bottom, giving $\lambda A_{x,y}^1$ as desired. The natural numbers will then give the required column of results, of which it does not seem necessary to give an example, as these will be found in the Appendix to Vol. I. at different rates of interest, calculated for difference of age 15. These were found in the way now shown, and similar results may be obtained with equal facility for every other difference of age. By using the Col. $\lambda R_{x,y}^1$ in place of $\lambda M_{x,y}^1$, the value of Increasing Assurances may be obtained in like manner; and if we substitute the column $\lambda N_{x,y}$ for $\lambda D_{x,y}$, and subtract as before, we shall find the log. annual premiums for these assurances respectively, to which the natural numbers should be got in order to obtain the annual premiums.

FIG. 17.

Formation of Column $\lambda A_{x,y}^1$

15		15		15	
C	3	C	3	C	3
$\lambda D_{x,y}$		$\lambda M_{x,y}^1$		$\lambda A_{x,y}^1$	
7.606 7821		6.833 2332		9.226 4511	
7.518 6698		6.818 6888		9.300 0190	
7.466 4115		6.804 8670		9.338 4555	
7.421 4106		6.791 7311		9.370 3205	
7.388 7396		6.779 2779		9.390 5388	
7.360 1901		6.767 2576		9.407 0675	
7.336 4745		6.755 5439		9.419 0694	
7.315 2430		6.744 3104		9.429 0674	
7.295 5207		6.733 2384		9.437 7177	
7.276 7471		6.722 2978		9.445 5507	
7.258 6054		6.711 4698		9.452 8644	
7.240 6259		6.700 4860		9.459 8601	
7.222 4785		6.689 6011		9.467 1226	
7.204 0775		6.678 3114		9.474 2339	
7.185 1896		6.665 8591		9.480 6695	
7.165 6568		6.651 9768		9.486 3200	
7.145 7129		6.637 8921		9.492 1792	
7.125 4974		6.623 8588		9.498 3614	
7.105 2250		6.610 1328		9.504 9078	
7.084 9662		6.596 7227		9.511 7565	
7.064 6412		6.583 3900		9.518 7488	
7.044 2490		6.570 1372		9.525 8882	
7.023 7778		6.556 7227		9.532 9449	
* * *		* * *		* * *	

CASE 2. *To determine the value of an assurance of £1 on the Young Life (y) against the Old Life (x).*

In this case we make use of the same slips d_x and $l_{y+\frac{1}{2}}$ as in the last case, but they now become differently related to one another, since we call d_x d_y , and $l_{y+\frac{1}{2}}$ $l_{x+\frac{1}{2}}$; and as the surviving life is now the *older* of the two given lives, the element v falls to be combined in this case with $l_{x+\frac{1}{2}}$ in place of with d_x , as in the last case. By adopting the same reasoning as before (p. lviii.), the value of the total payments to be made at the end of the first, second, etc. years, shall be—

$$\begin{aligned} d_y \cdot v l_{x+\frac{1}{2}} & \text{ for the first year.} \\ d_{y+1} \cdot v^2 l_{x+\frac{1}{2}} & \text{ for the second year.} \\ d_{y+2} \cdot v^3 l_{x+\frac{1}{2}} & \text{ for the third year.} \\ \text{etc.} & \qquad \qquad \text{etc.} \end{aligned}$$

Hence, by adding these several products together, and dividing by $l_x \cdot l_y$, we shall have, as the total value of the assurance on the life of (y) against (x),

$$\frac{d_y \cdot v l_{x+\frac{1}{2}} + d_{y+1} \cdot v^2 l_{x+\frac{1}{2}} + d_{y+2} \cdot v l_{x+\frac{1}{2}} + \&c.}{l_x \cdot l_y}$$

If the numerator and denominator of the above expression be multiplied by v^x , as in the last case, it will become

$$\frac{d_y \cdot v^{x+1} l_{x+\frac{1}{2}} + d_{y+1} \cdot v^{x+2} l_{x+\frac{1}{2}} + d_{y+2} \cdot v^{x+3} l_{x+\frac{1}{2}} + \&c.}{v^x \cdot l_x \cdot l_y} = D_{x,y}$$

or in a more convenient form,

$$\frac{d_y \cdot D_{x+\frac{1}{2}} + d_{y+1} \cdot D_{x+\frac{1}{2}} + d_{y+2} \cdot D_{x+\frac{1}{2}} + \&c.}{D_{x,y}} = \frac{M_{x,y}^{-1}}{D_{x,y}}$$

The above is therefore the working formula for computing the value of the function $\lambda C_{x,y}^{-1}$; and this is done by multiplication of the factors d_y and $D_{x+\frac{1}{2}}$ for every difference of x and y , or to whatever difference of age the tables may be required. In order to effect the multiplication according to our method, the logarithms of the two factors d_y and $D_{x+\frac{1}{2}}$, with their successive values, should be written on slips. As these are the fundamental slips for computing tables on the *young* life against

the old life, they have been inserted on the *right hand* page of the Appendix to Vol. II. on the Carlisle Mortality, at the five rates of interest used in the work. As a general rule, also, we would recommend that the paper from which these slips, as well as all other fundamental slips, are cut, should be strengthened by cotton pasted on the back. Initial or fundamental slips are more frequently handled than any other, and are consequently more liable to damage. And when it is important that they should be preserved, the precautionary step here suggested should not be omitted to be attended to.

Before exhibiting the mode of computing tables from them as a basis, it will be necessary in this case to show the mode of forming $\lambda D_{x+\frac{1}{2}}$. We had no such preparatory process under the last case before finding $\log. C_{x,y}^1$, since λC_x , with which the element v was combined, had been previously computed for single lives. In this instance, however, the elder class of lives is composed of the survivors $l_{x+\frac{1}{2}}$, and in their combination with class d_y , it is necessary to keep in view that the discount of money must be from the birth of the older life, as is always the case with the denominator $D_{x,y}$.

In framing $\lambda D_{x+\frac{1}{2}}$, Fig. 18, $\lambda l_{x+\frac{1}{2}}$ must be added to λv , as the sums payable on account of the deaths among class (y) before class (x) in the first year, are not due until the end of it. Hence the slip λv must be moved upwards one step before it is added. A blank slip being laid at the right side to receive the sums, the two slips $\lambda l_{x+\frac{1}{2}}$ and λv are then added together from top to bottom until $\lambda D_{x+\frac{1}{2}}$ is completed; and as this is a fundamental slip in this case, the examination of it cannot be too carefully performed, as the existence of an error not discovered in the comparison will run through the whole series of tables at that rate of interest.

The slip $\lambda D_{x+\frac{1}{2}}$ having been thus formed, the next step is to compute the function $\lambda C_{x,y}^1$ for every difference of (x) and (y), or to whatever extent the tables to be computed may be required. This is done by adding λd_y , which now becomes a stationary slip, while $\lambda D_{x+\frac{1}{2}}$, with which the interest v is

FIG. 18.

Formation of $\lambda D_{x+\frac{1}{2}}$

3 per cent. λv^x	Carlisle Mortality. $\lambda l_{x+\frac{1}{2}}$	C 3 $\lambda D_{x+\frac{1}{2}}$
0.000 0000		
9.987 1628	3.965 2252	3.952 3880
9.974 3256	3.909 5560	3.883 8816
9.961 4883	3.876 5931	3.838 0814
9.948 6511	3.853 6919	3.802 1059
9.935 8139	3.838 4548	3.774 5056
9.922 9767	3.828 4343	3.751 4110
9.910 1394	3.821 8409	3.731 9803
9.897 3022	3.817 2347	3.714 5369
9.884 4650	3.813 8811	3.698 3461
9.871 6278	3.811 3404	3.682 9682
9.858 7905	3.809 2566	3.668 0471
9.845 9533	3.807 2305	3.653 1838
9.833 1161	3.805 0929	3.638 2090
9.820 2789	3.802 8763	3.623 1552
9.807 4416	3.800 5453	3.607 9869
9.794 6044	3.797 9942	3.592 5986
9.781 7672	3.795 1846	3.576 9518
9.768 9300	3.792 2165	3.561 1465
	3.789 1928	
	* * *	* * *

combined, becomes moveable upwards, according to the difference of age. Fig. 19 shews the position of the slips in forming $\lambda C_{x,y}^{-1}$ for a difference of five years. The slip $\lambda D_{x+\frac{1}{2}}$ is five steps above the other two, while the difference of age is denoted by the figure 5, marked at the top of $\lambda C_{x,y}^{-1}$. In this position the slips

FIG. 19.
Formation of Column $\lambda C_{x,y}^{-1}$.

	C 3 $\lambda D_{x+\frac{1}{2}}$	5 C 3 $\lambda C_{x,y}^{-1}$
	3.952 3880	
	3.883 6816	
Carlisle Mortality.	3.838 0814	
λd_y	3.802 1059	
	3.774 5056	
3.187 2386	3.751 4110	6.938 6496
2.833 7844	3.731 9803	6.565 7647
2.703 2914	3.714 5369	6.417 8283
2.440 9091	3.698 3461	6.139 2552
2.303 1961	3.682 9682	5.986 1643
2.082 7854	3.668 0471	5.750 8325
1.913 8139	3.653 1838	5.566 9977
1.763 4280	3.638 2090	5.401 6370
1.633 4685	3.623 1552	5.256 6237
1.518 5139	3.607 9869	5.126 5008
1.462 3980	3.592 5986	5.054 9966
1.491 3617	3.576 9518	5.068 3135
1.505 1500	3.561 1465	5.066 2965
1.518 5139	3.545 2855	5.063 7994
1.544 0680	3.529 4033	5.073 4713
1.591 0646	3.513 4997	5.104 5643
1.623 2493	3.497 6102	5.120 8595
* * *	* * *	* * *

the following order :—

1. For (x) against (y) $\lambda C_{x,y}^{-1}$, $C_{x,y}^{-1}$, $M_{x,y}^{-1}$, $R_{x,y}^{-1}$, derived from λC_x and $\lambda l_{x+\frac{1}{2}}$
2. For (y) against (x) $\lambda C_{x,y}^{-1}$, $C_{x,y}^{-1}$, $M_{x,y}^{-1}$, $R_{x,y}^{-1}$, derived from λd_y and $\lambda D_{x+\frac{1}{2}}$

Looking therefore to the illustrations already given of the mode of computing, there seems nothing extraordinary in any two persons possessing but a moderate acquaintance with arithmetic and a practical knowledge of logarithms, undertaking the construction of such tables, provided they are supervised by one who understands the theory of the process in detail. The value of the system of computation

λd_y and $\lambda D_{x+\frac{1}{2}}$ are added together from top to bottom, and the successive sums placed on the slip $\lambda C_{x,y}^{-1}$ until it is filled. On its being completed, the newly formed slip is removed, and another blank slip laid down in its place. But, before addition, the slip $\lambda D_{x+\frac{1}{2}}$ is moved upwards as many steps as is denoted by the number marked at the top of the new slip to be formed. In constructing these Tables, this process was continued from difference 0 to 52, until the whole set of 53 slips of $\lambda C_{x,y}^{-1}$ was completed. When this was done, a thorough comparison of the work of both computers was made before the natural numbers were obtained, and these having been got, they were carefully read over, before the slips were summed up.

When the functions $C_{x,y}^{-1}$ and $C_{x,y}^{-1}$ have once been found for every difference of age, the finding of the remaining functions $M_{x,y}^{-1}$ and $R_{x,y}^{-1}$, with their opposite values $M_{x,y}^{-1}$ and $R_{x,y}^{-1}$, becomes a work of mere summation in the usual way. To obtain these, we have seen that four sets of functional values derivable from each other, are produced in

just explained arises from its being at once accurate and simple, and therefore easily managed by persons who are not actuaries by profession. While the work proceeds, the mind is by this method kept free from distracting thought, from the work in hand being at the time all of one kind; and though the actuary's comparisons and subsequent examinations must necessarily be minute and sifting, his labour is at the same time rendered comparatively light and pleasant, from the system itself possessing such a mechanical feature.

The method of computation just detailed was closely followed in the construction of the tables composing volume II. When the different sets of $\lambda C_{x,y}^1$ and $\lambda C_{x,y}^{-1}$ had been computed, the duplicates were carefully compared, and the errors marked and corrected; but the duplicates of $C_{x,y}^1$, $M_{x,y}^1$, $C_{x,y}^{-1}$, and $M_{x,y}^{-1}$ were read over before they were summed up, and the reading of the last results $R_{x,y}^1$ and $R_{x,y}^{-1}$ served to prove the accuracy of the whole.

As it sometimes happens, however, that computers fall into error at the same place, in which event errors so committed, unless very glaring, cannot well be detected by comparison, it was deemed necessary, in order to ensure accuracy in the tables as far as possible, to apply a farther test as a cross-check, derived from the following equation for the Joint Assurance, viz.

$$\frac{1 - \epsilon a_{x,y}}{1 + \epsilon} = \frac{M_{x,y}^1 + M_{x,y}^{-1}}{D_{x,y}}$$

The value of $a_{x,y}$ was derived from the Commutation Tables for Joint Lives in the usual way; and the value of the left-hand side of the equation was afterwards found by the ordinary rule. The value of the right-hand side was obtained from the new tables in Vol. II.; and as both classes of tables were computed from independent sources, the final agreement of the results was held to be sufficient proof that no inherent error existed in them. An example was selected for every difference of age, one of the ages being seven, and the values of the joint assurance thus brought out were found to agree even in the seventh decimal place, with occasional differences varying from one to four units.

The Tables were again subjected to a thorough revision while the work was passing through the press. And as the form in which they left the hands of the computer was that designed for their publication, it was wholly unnecessary to transcribe them for the press, as is generally done, on which account not only time was saved, but the risk of committing additional errors from transcribing was thereby entirely avoided. The press was accordingly prepared from

one duplicate, and read twice from the other. Every care was taken, at the same time, to prevent errors in the work arising from other causes; and without venturing to pronounce the tables absolutely free from error of every kind, the author believes they will be found to be as perfect in this respect as any other class of tables of equal bulk hitherto published.

USE OF THE TABLES.

The importance of the new tables consists not merely in their affording the means whereby the values of various assurances on one life against another may be calculated by the ordinary well-known rules originated by Barrett's system of computation; but it will be found, from the introduction of the R column, that a variety of other questions in Life Assurance, hitherto of difficult solution, easily suggest themselves as practicable, if not perhaps as useful additions to the ordinary transactions of Insurance Companies.

The following examples will illustrate a few of the purposes to which the Tables may be applied. Though the operation of division has, in a few instances, been effected by means of logarithms, it is not because that mode is here recommended, for it will often be found that *actual division* is the speediest mode of arriving at the result, even when tables of logarithms are at hand.

I. ASSURANCES FOR THE WHOLE TERM OF LIFE.

Ex. 1. Required the present value of an assurance of £500 on (30) against (25), at Carlisle 3 per cent.

Here the formula is No. 1 of the list prefixed to Volume II., where $x = 30$, and $y = 25$.

$$\therefore \frac{M_{x,y}^{-1}}{D_{x,y}} = \frac{M_{30,25}^{-1}}{D_{30,25}} = \frac{3767017.5}{13665320}.$$

By logarithms.

$$3767017.5 \text{ log. } = 6.575 \ 9977$$

$$13665320. \text{ ,, } = 7.135 \ 6197$$

$$\underline{9.440 \ 3780} = 275663 \text{ Present value of } \underline{\text{£1}} \text{ on (30) against (25).}$$

500

$$\underline{137.8315} = \text{£137 : 16 : 7 Answer.}$$

Ex. 2. *Required the Annual Premium for the assurance in the preceding example.*

Here the formula is that of No. 2.

$$\therefore \frac{M_{x,y}^1}{N_{x,y}} = \frac{M_{30,25}^1}{N_{30,25}} = \frac{3767017.5}{236560395}.$$

By logarithms.

$$\begin{array}{r} 3767017.5 \text{ log.} = 6.575 \ 9977 \\ 236560395. \text{ „} = 8.373 \ 9420 \\ \hline 8.202 \ 0557 = .015924 = \text{Annual Premium for } \pounds 1 \text{ on (30) against (25).} \\ \hline 500 \\ \hline 7.962065 = \pounds 7 : 19 : 3 \quad \text{Do. for } \pounds 500 \text{ on do.} \end{array}$$

Ex. 3. *Required the present value of an assurance of £500 on (25) against (30), at Carlisle 3 per cent.*

Here the formula is No. 13, where x and y are as in the last example.

$$\therefore \frac{M_{x,y}^1}{D_{x,y}} = \frac{M_{30,25}^1}{D_{30,25}} = \frac{3008193.3}{13665320}.$$

By logarithms.

$$\begin{array}{r} 3008193.3 \text{ log.} = 6.478 \ 3058 \\ 13665320. \text{ „} = 7.135 \ 6197 \\ \hline 9.342 \ 6861 = .220133 = \text{Present value of } \pounds 1 \text{ on (25) against (30).} \\ \hline 500 \\ \hline 110.0667 = \pounds 110 : 1 : 4 \text{ Answer.} \end{array}$$

Ex. 4. *Required the Annual Premium for the assurance in the preceding example.*

Here the formula is that of No. 14.

$$\therefore \frac{M_{x,y}^1}{N_{x,y}} = \frac{M_{30,25}^1}{N_{30,25}} = \frac{3008193.31}{236560395}.$$

By logarithms.

$$\begin{array}{r} 3008193.3 \text{ log.} = 6.478 \ 3058 \\ 236560395. \text{ „} = 8.373 \ 9420 \\ \hline 8.104 \ 3638 = .0127164 = \text{Annual Premium for } \pounds 1 \text{ on (25) against (30).} \\ \hline 500 \\ \hline 6.3582 = \pounds 6 : 7 : 2 \quad \text{Do. for } \pounds 500 \text{ on do.} \end{array}$$

Ex. 5. *Required the present value of an assurance of £500 on (30) against (25), at Carlisle 3 per cent, with return of premium paid if (25) should predecease (30).*

$$\text{Here the formula is that of No. 3} = \frac{M_{x,y}^1}{D_{x,y} - M_{x,y}^1}$$

$$\therefore \frac{M_{x,y}^1}{D_{x,y} - M_{x,y}^1} = \frac{M_{30,25}^1}{D_{30,25} - M_{30,25}^1} = \frac{3767017.5}{13665320. - 3008193.} = \frac{3767017.5}{10657127.}$$

By division.

$$\begin{array}{r} 10657127.)3767017.5(.353474 = \text{Value of £1 on (30) against (25), with return.} \\ \underline{3197138 \ 1} \qquad \qquad \qquad 500 \\ 569879 \ 4 \ 176.7370 = \text{£176 : 14 : 9} \quad \text{Do. for £500.} \\ \underline{532856 \ 3} \\ 37023 \ 1 \\ \underline{31971 \ 4} \\ 5051 \ 7 \end{array}$$

Ex. 6. *A gentleman has an only daughter, for whose benefit he proposes to insure his life for £1000, stipulating that the policy is to be cancelled, and the premiums paid returned by the office should his daughter predecease him. Required the annual premium, the father's age being 48 and the daughter's 11. Interest at $3\frac{1}{8}$ per cent.*

$$\text{Here the formula is that of No. 4} = \frac{M_{x,y}^1}{N_{x,y} - R_{x,y}^1}$$

$$\therefore \frac{M_{x,y}^1}{N_{x,y} - R_{x,y}^1} = \frac{M_{48,11}^1}{N_{48,11} - R_{48,11}^1} = \frac{2368898.42}{78781609. - 7229424.} = \frac{2368898.42}{71552185.}$$

By division.

$$\begin{array}{r} 71552185.)2368898.42(.0331073 \text{ Annual Premium per £1.} \\ \underline{2146565 \ 55} \qquad \qquad \qquad 1000 \\ 222332 \ 87 \ 33.1073 = \text{£33 : 2 : 2 Answer.} \\ \underline{214656 \ 55} \\ 7676 \ 32 \\ \underline{7155 \ 22} \\ 521 \ 10 \end{array}$$

Ex. 7. *Required the Annual Premium for an assurance of £100 on (50) against (35), with an increase of £1 for each annual premium paid during the subsistence of the policy, i.e., the assurance to be for £101 the first year, £102 the second year, £103 the third year, etc., and the premiums paid to the office to be returned should (35) predecease (50). Carlisle 3 per cent.*

Here the formula is evidently the sum of No. 4 \times 100 and No. 8,

$$= \frac{100 M_{x,y}^1 + R_{x,y}^1}{N_{x,y} - R_{x,y}^1}$$

$$\therefore \frac{100 M_{50,35}^1 + R_{50,35}^1}{N_{50,35} - R_{50,35}^1} = \frac{226913713. + 36519753.}{71597426. - 13470039.} = \frac{263433466.}{58127387}$$

By division.

$$\begin{array}{r} 58127387 \overline{) 263433466.} \quad (4.532 = £4 : 10 : 8 \text{ Answer.} \\ \underline{232509548} \\ 30923918 \\ \underline{29063693} \\ 1860225 \\ \underline{1743822} \\ 116403 \end{array}$$

Ex. 8. *Required the Single and Annual Premiums for an assurance of £100, payable on the death of the survivor of two lives aged 47 and 42. Carlisle 4 per cent.*

The formula by the Commutation Tables for this question, applicable to the single payment, is that of No. 11, and for the annual premium it would be even more complicated. Formula No. 11 has been added merely to make the list more complete, and to show that *Single* and *Joint* Commutation Tables cannot well be combined so as to make one convenient formula. The usual cases of reversionary annuities, annuities on the longest liver, etc., are therefore more easily calculated by the common *Single* and *Joint* Annuity Tables than by Commutation Tables.

When, with a particular order of survivorship, however, a *return of premium* forms a condition of the question, a combination of the *Single* and *Joint* Commu-

tation Tables cannot well be avoided, and the formulæ in such instances become not only indispensable, but valuable additions to the list. Such cases will be found under class "VI. Survivorship Annuities," to which we shall afterwards have occasion to refer.

Though we do not recommend formula No. 11 as one that should be followed, we subjoin, by way of illustration and verification of the tables, the solution of the question derived from it, so far as regards the single payment, adding solutions by other two methods, either of which may be followed in preference.

$$\text{Formula for the Single Payment, No. 11} = \frac{l_y M_x + v^{x-y} l_x M_y - M_{x,y}}{D_{x,y}}$$

Or,

$$\frac{l_{42} M_{47} + v^5 l_{47} M_{42} - M_{47.42}}{D_{47.42}} \text{ developed as under.}$$

$$\lambda l_{42}, \text{ Vol. I., p. 26} = 3.693\ 7269$$

$$\lambda M_{47}, \text{ ,, p. 54} = 2.500\ 6163$$

$$\underline{6.194\ 3432} = 1564\ 384.$$

$$\lambda v^5, \text{ Vol. I., p. 20} = 9.914\ 8333$$

$$\lambda l_{47}, \text{ ,, p. 26} = 3.661\ 6234$$

$$\lambda M_{42}, \text{ ,, p. 54} = 2.576\ 4158$$

$$\underline{6.152\ 8725} = 1421\ 911.$$

$$\text{Sum} = 2986\ 295.$$

$$M_{47.42}^1, \text{ Vol. II., p. 228} = 1071\ 442.6$$

$$M_{47.42}^{\frac{1}{2}}, \text{ ,, p. 229} = 824\ 865.9$$

$$M_{47.42}, \text{ being the sum thereof} = 1\ 896\ 309.$$

$$\lambda 6.037\ 4219 = 1\ 089\ 986. \text{ Difference.}$$

$$\lambda D_{47.42} = 6.554\ 7834$$

$$\underline{9.482\ 6385} = .303\ 835 \text{ Single Payment.}$$

SECOND METHOD.

$$\begin{aligned}
 M_{47.42} &= 1896309. \text{ as above} &= \lambda 6.277\ 9091 \\
 D_{47.42} \text{ Log. thereof, as above} &= \lambda 6.554\ 7834 \\
 &\lambda 9.723\ 1257 &= .528598 = A_{47.42};
 \end{aligned}$$

Whence

$$\begin{aligned}
 A_{47}, \text{ Vol. I., p. 42} &= 436074 \\
 A_{42}, \text{ ,, p. 42} &= 396359 \\
 \text{Sum} &= .832433 \\
 A_{47.42}, \text{ as above} &= 528598 \\
 \hline
 &= .303835 \text{ Single Payment, as before.}
 \end{aligned}$$

We have only given by these methods solutions for the single payment, a farther calculation being necessary when the annual premium is required. But as they are not recommended to be followed, we add a third method derived from the old and well-known formula $\frac{1 - \rho(a_x + a_y - a_{x,y})}{1 + \rho}$, which is much to be preferred, as it contains within itself all that is required for finding both the single payment and the annual premium. The only unknown quantity is $a_{x,y}$, the value of the joint annuity, which is easily obtained from the Commutation Tables.

THIRD METHOD.

$$\frac{N_{48.43}}{D_{47.42}} = \frac{40381720.5}{3587429.8} = 11.25645 = a_{47.42}.$$

Whence—

$$\begin{array}{rcl}
 a_{47}, \text{ p. 38} &= 13.66208 & 17.10028 \\
 a_{42}, \text{ p. 38} &= 14.69465 & .04 \\
 \hline
 &28.35673 & .6840112 \\
 a_{47.42} &= 11.25645 & \\
 a_x + a_y - a_{x,y} &= 17.10028 & \\
 \hline
 &312 & \\
 &398 & \\
 &312 & \\
 \hline
 &868 & \\
 &832 & \\
 &368 & \\
 &312 & \\
 \hline
 &18.10028 & \text{Annual Premium.} \\
 &\therefore \frac{303835}{18.10028} &= .016786
 \end{array}$$

II. TEMPORARY ASSURANCES.

Ex. 9. *Required the present value of an assurance of £500 on (38) against (35) during the next 15 years. Carlisle 3 per cent.*

$$\text{Here the formula is that of No. 21} = \frac{M_{x,y}^1 - M_{x+n,y+n}^1}{D_{x,y}} =$$

$$\frac{M_{38.35}^1 - M_{53.50}^1}{D_{38.35}} = \frac{2698967.67 - 1442696.07}{9057622.4} = \frac{1256271.6}{9057622.4}$$

$$9057622.4)1256271.60(.1386977 = \text{Value of £1 on (38) against (35.)}$$

$$\begin{array}{r} 905762 \ 24 \qquad \qquad 500 \\ \hline 350509 \ 36 \end{array}$$

$$69.34885 = \text{£}69 : 6 : 11 \text{ Answer.}$$

$$271728 \ 67$$

$$\hline 78780 \ 69$$

$$72460 \ 98$$

$$\hline 6319 \ 71$$

$$5434 \ 57$$

$$\hline 885 \ 14$$

Ex. 10. *Required the present value of the same assurance when the ages are reversed, i. e., on (35) against (38).*

$$\text{Here the formula is that of No. 25} = \frac{M_{x,y}^1 - M_{x+n,y+n}^1}{D_{x,y}}$$

$$\frac{M_{38.35}^1 - M_{53.50}^1}{D_{38.35}} = \frac{2313826.06 - 1143561.65}{9057622.4} = \frac{1170264.41}{9057622.4}$$

$$9057622.4)1170264.41(.1292022 = \text{Value of £1 on (35) against (38).}$$

$$\begin{array}{r} 905762.24 \qquad \qquad 500 \\ \hline 264502 \ 17 \end{array}$$

$$64.60108 = \text{£}64 : 12s. \text{ Answer.}$$

$$181152 \ 45$$

$$\hline 83349 \ 72$$

$$81518 \ 60$$

$$\hline 1831 \ 12$$

$$1811 \ 52$$

$$\hline 19 \ 60$$

Ex. 11. *Required the Annual Premium for an assurance of £100 on (35) against (23) during the next 5 years. Carlisle 3 per cent.*

$$\text{Formula No. 22} = \frac{M_{xy}^1 - M_{x+n, y+n}^1}{N_{xy} - N_{x+n, y+n}}$$

$$\therefore \frac{M_{35,23}^1 - M_{40,28}^1}{N_{35,23} - N_{40,28}} = \frac{3644395.9 - 3097978.6}{191182462. - 139383690.} = \frac{546417.30}{51798772.}$$

51798772.) 546417.30 (.0105488 Annual Premium for £1.

517987 72	100	
28429 58	1.05488	= £1 : 1 : 1 per cent.
25899 39		
2530 19		
2071 95		
458 24		
414 39		

Ex. 12. *Required the Annual Premium for the same assurance when the ages are reversed.*

$$\text{Formula No. 26} = \frac{M_{xy}^1 - M_{x+n, y+n}^1}{N_{xy} - N_{x+n, y+n}}$$

$$\therefore \frac{M_{35,23}^1 - M_{40,28}^1}{N_{35,23} - N_{40,28}} = \frac{2150071.36 - 1784902.29}{51798772.} = \frac{365169.07}{51798772.}$$

51798772.) 365169.070 (.00704976

362591 404	100	
2577 666	.704976	= 14s. 2d. per cent.
2071 951		
505 715		
466 189		
39 526		

Ex. 13. *Required the Annual Premium to insure £100 during the next ten years on (56) against (27), with a return of all the premiums paid in the event of (27) predeceasing (56) within that time. Interest at the rate of $3\frac{1}{2}$ per cent.*

Here the formula is that of No. 24, viz.—

$$\frac{M_{x,y}^1 - M_{x+n,y+n}^1}{N_{x,y} + R_{x+n,y+n}^1 + n M_{x+n,y+n}^1 - N_{x+n,y+n} - R_{x,y}^1}$$

SOLUTION.

$M_{66.37}^1 = 170224.34$		$N_{66.37} = 13430208.2$
$10 = n$		$R_{66.37}^1 = 4174589.9$
<u>1702243.4</u>		<u>b ... 17604797.1</u>
$R_{66.37}^1 = 1304076.8$		
$N_{66.37} = 38509085.6$		
<u>a ... 41515405.8</u>		
<u>b ... 17604797.1</u>		
$a - b ... 23910608.7$	728135.6	$(.0304524 \text{ Annual Premium for } £1.$
	<u>717318 3</u>	<u>100</u>
$M_{66.37}^1 = 1672946.59$	<u>10817 3</u>	$3.04524 = £3 : 0 : 11 \text{ per cent.}$
$M_{66.37}^1 = 944810.99$	<u>9564 2</u>	
<u>Dividend = 728135.60</u>	<u>1253 1</u>	
	<u>1195 5</u>	
	<u>57 6</u>	
	<u>47 8</u>	

When the annual premium for temporary or deferred benefits is returnable on the occurrence of an event which must happen within a given time, the divisor is necessarily more complicated than in cases where the premium is payable for the whole of life. But as all Commutation Tables are identical in the principle of their construction, the formulæ applicable to such tables must be analogous to each other, whatever be the nature of the contingency involved in them; hence the divisor in this example is similar to that obtained for single lives in art. 267

of Mr. Jones' work on Reversionary Payments. The composition of the divisor, however, may be shown very clearly by reference to Fig. A, p. lxxxiii., which may be explained as follows:—

If the first column C_x contains the successive values of that function to the end of life, their sum, or the part included between AL, will express the value of column M_x . In like manner, the sum of the second column, C_{x+1} , etc., will express the value of M_{x+1} , and so on. But the sum of all the vertical columns make up the triangle ALZ. Hence the triangle ALZ, which contains the sum of all the M's, will express the value of R_x . R_{x+1} will therefore be represented by the entire triangle ALZ, less the first column M_x . R_{x+2} will be represented by the triangle ALZ, less the two first columns M_x and M_{x+1} , and so on.

As the summations of the several vertical columns all terminate with the oldest life in the table, it is plain that if the summation of each column is made to terminate at any earlier age, suppose $x + 10$, then the parts of those columns above the line BE being summed up, will express the values of M_x , M_{x+1} , M_{x+2} , etc., up to that age, while the relative value of R_x will be denoted by the triangle ABE.

In all cases of returnable premiums payable for a given number of years, that portion of the column R_x which is to be taken away from $N_x - N_{x+n}$ is denoted by the triangle ABE, which is evidently equal to the triangle ALZ — \square BEHL — \triangle EHZ, or expressed in the notation applicable to the Survivorship Tables equal to $R_{x,y} - nM_{x+n,y+n} - R_{x+n,y+n}$.

The divisor is therefore—

$$\begin{aligned} N_{x,y} - N_{x+n,y+n} - (R_{x,y} - nM_{x+n,y+n} - R_{x+n,y+n}) \\ = N_{x,y} - N_{x+n,y+n} - R_{x,y} + nM_{x+n,y+n} + R_{x+n,y+n} \end{aligned}$$

Or, by arranging the positive and negative quantities together, it will be—

$$N_{x,y} + R_{x+n,y+n} + nM_{x+n,y+n} - N_{x+n,y+n} - R_{x,y},$$

which agrees *mutatis mutandis* with that given in Mr. Jones' work, "On the Value of Annuities," art. 267.

III. DEFERRED ASSURANCES.

Ex. 14. *Required the present value of a Survivorship Assurance of £100 on (38) against (35), to commence on the expiry of 15 years. Interest at 3 per cent.*

Here the formula is that of No. 29 = $\frac{M_{x+n,y+n}^1}{D_{x,y}}$

$$\frac{M_{53,50}^1}{D_{38,35}} = \frac{1442696.07}{9057622.3}$$

$$\begin{array}{r} 9057622.3)1442696.07(.15928 \\ \underline{905762 \ 23} \qquad 100 \\ 536933 \ 84 \ 15.928 = \text{£}15 : 18 : 7 \text{ Answer.} \\ \underline{452881 \ 11} \\ 84052 \ 73 \\ \underline{81518 \ 60} \\ 2534 \ 13 \\ \underline{1811 \ 52} \\ 722 \ 61 \end{array}$$

Ex. 15. *Required the present value of the same Assurance, with return of the premium paid if (35) predecease (38) before the expiry of 15 years. Interest at 3 per cent.*

Here the formula is that of No. 32 = $\frac{M_{x+n,y+n}^1}{D_{x,y} + M_{x+n,y+n}^1 - M_{x,y}^1}$

$$\therefore \frac{M_{53,50}^1}{D_{38,35} + M_{53,50}^1 - M_{38,35}^1} = \frac{1442696.07}{9057622.3 + 1143561.7 - 2313826.1} = \frac{1442696.07}{7887357.9}$$

$$\begin{array}{r} 7887357.9)1442696.07(.182912 \\ \underline{788735 \ 79} \qquad 100 \\ 653960 \ 28 \ 18.2912 = \text{£}18 : 5 : 10 \text{ Answer.} \\ \underline{630988 \ 63} \\ 22971 \ 65 \\ \underline{15774 \ 72} \\ 7196 \ 93 \\ \underline{7098 \ 61} \end{array}$$

Ex. 16. *Required the Annual Premium payable during the joint lives for an Assurance of £100 on (45) against (57), to commence in seven years, with return of the premiums paid should (57) predecease (45). Interest at 3 per cent.*

$$\text{Here the formula is that of No. 42} = \frac{M_{\overline{x+n.y+s}}^1}{N_{x,y} - R_{x,y}^1}$$

$$\therefore \frac{M_{\overline{61.53}}^1}{N_{57.45} - R_{57.45}^1} = \frac{436520.09}{37355432.7 - 19950802.2} = \frac{436520.09}{17404630.5}$$

17404630.5	436520.09	(.025081
	348092 61	100
	88427 48	2.5081 = £2 : 10 : 2 per cent.
	87023 15	
	1404 33	
	1392 37	
	11 96	

IV. JOINT ASSURANCES.

Ex. 17. *Required the Annual Premium to insure £100 payable on the decease of either of two lives aged 44 and 35. Interest at 3½ per cent.*

$$\text{Here the formula is that of No. 44} = \frac{M_{x,y}^1 + M_{x,y}^1}{N_{x,y}}$$

$$\text{Hence } \frac{M_{\overline{44.35}}^1 + M_{\overline{44.35}}^1}{N_{44.35}} = \frac{1842695.48 + 1179993.67}{78064309.6} = \frac{3022689.15}{78064309.6}$$

78064309.6	3022689.15	(.03872
	2341929 27	100
	680759 88	3.872 = £3 : 17 : 5 Answer.
	624514 77	
	56245 41	
	54645 01	
	1600 40	

Ex. 18. *Required the Annual Premium to insure £100 payable on the decease of (35) or (23), provided either of these events happen during the next 5 years. Interest at 3 per cent.*

Here the formula is that of No. 46, viz. $\frac{M_{x,y|n}}{N_{x,y|n}}$

$$M_{40.23}^1 = 3097978.6$$

$$M_{35.23}^1 = 3644395.9$$

$$M_{40.23}^1 = 1784902.3$$

$$M_{35.23}^1 = 2150071.4$$

$$\text{Sum} = 4882880.9$$

$$\text{Sum} = 5794467.3$$

$$4882880.9$$

$$\text{Dividend} = 911586.4$$

$$N_{35.23} = 191182462.$$

$$N_{40.23} = 139383690.$$

$$51798772.) 911586.4 (.017599 = \text{Annual Premium for } £1.$$

$$517987 \quad 7 \quad 100$$

$$393598 \quad 7 \quad 1.7599 = £1 : 15 : 3 \text{ per cent. Answer.}$$

$$362591 \quad 4$$

$$31007 \quad 3$$

$$25899 \quad 4$$

(This result is, as it ought to be, equal to the sum of the results in Examples 11 and 12.)

$$5107 \quad 9$$

$$4661 \quad 9$$

$$446 \quad 0$$

SECOND METHOD.

$$\text{Formula} = v - \frac{N_{(x,y)+1|n}}{N_{x,y|n}}$$

$$N_{35.23} = 191182462. \quad 179819573. = N_{36.24}.$$

$$N_{40.23} = 139383690. \quad 130441090. = N_{41.23}.$$

$$51798772.) \quad 49378483. \quad (.953275 = \frac{N_{(x,y)+1|n}}{N_{x,y|n}}$$

$$46618895$$

$$2759588$$

Hence—

$$2589939$$

$$v, \text{ at 3 per cent} = .970874$$

$$169649$$

$$\frac{N_{(x,y)+1|n}}{N_{x,y|n}} = .953275$$

$$155396$$

$$.017599 = \text{Annual}$$

$$14253$$

Premium for £1, as before.

$$10360$$

$$3893$$

In calculating the premiums for Joint Assurances for a term of years, on two given lives (x) and (y), it has sometimes been thought that the calculation might be simplified by finding a life (z) equal in value to the two given lives, and calculating the premium for (z) according to the ordinary rule for single lives. In transactions for the whole of life, the substitution of one life equal in value to two given lives, may cause but little deviation from the truth; but that it is a safe rule to follow in all cases, is a fallacious assumption, leading to the most erroneous results. And it may be easily shown in the case of temporary assurances on joint lives, that the premiums obtained on this principle are inadequate to the risk.

In the last example, for instance, the joint lives of (35) and (23) will be found equal to a single life of (44). Now, if the assumption be correct, it follows that the chance of (44) dying within the next five years, must be equal to the chance of the joint lives (35) and (23) failing in the same time. But the probability of (44) failing in five years is equal to $1 - \frac{4458}{4798} = 1 - .929137 = .070863$; and the probability of the joint existence of (35) and (23) failing in five years, is equal to $1 - \frac{5075 \times 5748}{5362 \times 5963} = 1 - \frac{29171100}{31973606} = 1 - .9123494 = .0876506$, that is to say, the number of instances in which a policy will become payable in 5 years is about two per cent greater in the case of the joint lives, than among single lives of equal value, and therefore proving that a higher premium should be paid. Accordingly, the annual premium for an assurance of £1 for 5 years on Age 44 will, by the ordinary rule for single lives, be found to be .0141835, while by the question the annual premium for a like assurance on the joint lives of (35) and (23) is .0175986.

V. VALUATION OF POLICIES.

Ex. 19. Required the present value of a Policy of Assurance for £500 which has run 20 years, on the life of a person now aged 50 against another now aged 45, the annual premium being 7.962 or .015924 per pound. Interest at 3 per cent.

Here the formula is that of No. 50, viz.—

$$\frac{M_{x+n,y+n} - p.N_{(x,y)+n}}{D_{(x,y)+n}} = \text{Value of Policy per } \text{£}1$$

$$\frac{M_{50.45}^1 - p.N_{50.45}}{D_{50.45}} = \frac{1740366.58 - .015924 \times 59644390.5}{4741118.6}$$

$$= \frac{1740366.58 - 949783.24}{4741118.6} = \frac{790583.34}{4741118.6}$$

$$\begin{array}{r} 4741118.6 \times 790583.34 \times .16675 \\ \hline 474111.86 \quad 500 \end{array}$$

316471 48 83.375 = Value of policy per £100.

284467 12

32004 36

28446 71

3557 65

3318 78

Ex. 20. Required the present value of a Policy of Assurance for £1000 on the life of a gentleman now aged 58 against his daughter now aged 21, which has run ten years, the annual premium being £33.10728, returnable should the daughter predecease him. Interest at $3\frac{1}{2}$ per cent.

Here the formula is that of No. 51, viz.,

$$\frac{M_{x+n,y+n}^1}{D_{(x,y)+n}} - \frac{M_{x+n,y+n}^1}{M_{x+n,y+n}^1 \cdot (1+n\pi)} - \frac{\pi \cdot N_{(x,y)+n}}{D_{(x,y)+n}}$$

the first part of which denotes the present value of the sum assured and the returnable premiums, while the second part denotes the value of the future premiums.

Ten years ago the ages were 48 and 11, and the annual premium to insure £1 on (48) against (11), with return of premiums if (11) predecease (48), is .03310728, of which ten premiums have now been paid. Consequently—

$$M_{58.21}^1 \cdot (1 + 10\pi) = 289691.51 \times 1.3310728 = 385600.48$$

$$\therefore \frac{M_{58.21}^1}{D_{58.21} - M_{58.21}^1 \cdot (1 + 10\pi)} = \frac{1697957.89}{3159053.9 - 385600.48}$$

$$= \frac{1697957.89}{2773452.4} = .61221815 = \text{Value of sum assured and returnable premiums.}$$

$$\frac{{}_7N_{58.51}}{D_{58.51}} = \frac{.03310728 \times 34640106}{3159053.9} = \frac{1146839.7}{3159053.9}$$

= .36303265 Value of future premiums.

Hence we have the value of a Policy for £1 under such conditions, as under—

.61221815 = Value of sum assured, and returnable premiums.

.36303265 = Value of future premiums.

.24918550 = Value of policy for £1.

1000

249.1855 = £249 : 3 : 1 Value of policy per £1000.

VI. SURVIVORSHIP ANNUITIES.

Ex. 21. *What sum should be paid to an assurance office to secure a survivorship annuity of £100 to a gentleman now aged 57, commencing on the death of his son aged 30, the premium paid to be returned should the father predecease the son. Interest at 3½ per cent.*

Here the formula is that of No. 56, or $\frac{{}_yN_{x+1} - N_{(x,y)+1}}{D_{x,y} - M_{x,y}^1}$

$$\therefore \frac{{}_yN_{58} - N_{58.51}}{D_{57.50} - M_{57.50}^1} = \frac{34589771.1 - 31212922.6}{3115746.6 - 1568716.8} = \frac{3376848.5}{1547029.8}$$

6130.7641 = N_{58}	1547029.8) 3376848.5 (2.18279 = Value of £1 per annum.
2465 = ${}_yN_{30}$ inverted.	3094059 6 100
306538205	282788 9 218.279 = £218 : 5 : 7 Answer.
36784585	154703 0
2452306	128085 9
122615	123762 4
34589771.1 = ${}_yN_{58}$	

Ex. 22. *A gentleman aged 47 proposes to purchase from an assurance office a survivorship annuity of £100 to his wife aged 42, to commence at his death, stipulating that all the premiums shall be returned should his wife predecease him. Required the single and annual premiums at 4 per cent interest.*

1. The formula for the Single Payment is that of No. 60

$$= \frac{v_{x-y} l_x N_{y+1} - N_{(x,y)+1}}{D_{x,y} - M_{x,y}^{-1}} = \frac{v^5 l_{47} N_{43} - N_{48.43}}{D_{47.43} - M_{47.43}^{-1}}$$

Hence—

$$\begin{aligned} \lambda v^5 &= 9.9148333 \\ \lambda l_{47} &= 3.6616234 \\ \lambda N_{43} &= 4.1454860 \end{aligned}$$

$$7.7219427 = 52716036. = v^5 l_{47} N_{43}.$$

$$\therefore \frac{v^5 l_{47} N_{43} - N_{48.43}}{D_{47.43} - M_{47.42}^{-1}} = \frac{52716036. - 40381720.}{3587430. - 824866.} = \frac{12334316.}{2762564.}$$

By division.

$$\begin{array}{r} 2762564.) 12334316. (4.4648 \\ \underline{11050256} \quad 100 \\ 1284060 \quad 446.48 = \text{£}446 : 9 : 7 \text{ Single Payment.} \\ \underline{1105026} \\ 179034 \\ \underline{165754} \\ 13280 \\ \underline{11050} \end{array}$$

2. The formula for the Annual Premium is that of No. 61 = $\frac{v^{x-y} l_x N_{y+1} - N_{(x,y)+1}}{N_{x,y} - R_{x,y}^{-1}}$

the numerator of which is the same as for the single payment.

$$\text{Hence } \frac{v^5 l_{47} N_{43} - N_{48.43}}{N_{47.42} - R_{47.43}^{-1}} = \frac{12334316.}{43969149. - 11246409.} = \frac{12334316.}{32722740.}$$

By division.

$$\begin{array}{r} 3272274.) 12334316. (.376934 = \text{Annual Premium for annuity of £1.} \\ \underline{981682 \ 2} \quad 100 \\ 251749 \ 4 \quad 37.6934 = \text{£}37 : 13 : 11 \text{ Annual Premium.} \\ \underline{229059 \ 2} \\ 22690 \ 2 \\ \underline{19633 \ 6} \\ 3056 \ 6 \\ \underline{2945 \ 0} \end{array}$$

Fig. A.

A	C _x	G	F	H	L
C _{x+1}	C _{x+1}				M _x
C _{x+2}	C _{x+2}				M _{x+1}
C _{x+3}	C _{x+3}				M _{x+2}
C _{x+4}	C _{x+4}				M _{x+3}
C _{x+5}	C _{x+5}				M _{x+4}
C _{x+6}	C _{x+6}				M _{x+5}
C _{x+7}	C _{x+7}				M _{x+6}
C _{x+8}	C _{x+8}				M _{x+7}
C _{x+9}	C _{x+9}				M _{x+8}
					M _{x+9}
					M _{x+10}
					M _{x+11}
					M _{x+12}
					M _{x+13}
					M _{x+14}
					M _{x+15}
					M _{x+16}
					M _{x+17}
					M _{x+18}
					M _{x+19}
					M _{x+20}
					M _{x+21}
					M _{x+22}
					M _{x+23}
					M _{x+24}
					M _{x+25}
					M _{x+26}
					M _{x+27}
					M _{x+28}
					M _{x+29}
					M _{x+30}
					M _{x+31}
					M _{x+32}
					M _{x+33}
					M _{x+34}
					M _{x+35}
					M _{x+36}
					M _{x+37}
					M _{x+38}
					M _{x+39}
					M _{x+40}
					M _{x+41}
					M _{x+42}
					M _{x+43}
					M _{x+44}
					M _{x+45}
					M _{x+46}
					M _{x+47}
					M _{x+48}
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					M _{x+50}
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					M _{x+56}
					M _{x+57}
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					M _{x+91}
					M _{x+92}
					M _{x+93}
					M _{x+94}
					M _{x+95}
					M _{x+96}
					M _{x+97}
					M _{x+98}
					M _{x+99}

FORMULÆ APPLICABLE TO THE TABLES IN VOL. I.

I. ENDOWMENTS.

- (1.) $\frac{D_{x+n}}{D_x} =$ The present value of £1 payable at the end of n years, provided a life (x) survive that term.
- (2.) $\frac{D_{x+n}}{N_x - N_{x+n}} =$ Annual Premium for the same.
- (3.) $\frac{D_{x+n}}{D_x + M_{x+n} - M_x} =$ Present Value of £1 payable at the end of n years, provided a life (x) survive that term, the premium being returnable six months after death, should (x) not live so long.
- (4.) $\frac{D_{x+n}}{N_x + R_{x+n} + nM_{x+n} - N_{x+n} - R_x} =$ Annual Premium for the same, all the premiums paid being returnable six months after death, should (x) not live so long.
- (5.) $\frac{M_x + D_{x+n} - M_{x+n}}{D_x} =$ Present Value of £1 payable at the end of n years, provided a life (x) survive that term, or payable at death, if that event shall happen sooner.
- (6.) $\frac{M_x + D_{x+n} - M_{x+n}}{N_x - N_{x+n}} =$ Annual Premium for the same.
-

II. ANNUITIES.

- (7.) $\frac{N_{x+1}}{D_x} =$ Present Value of an annuity of £1 payable yearly during the whole of life.

REMARK.—The first payment of an annuity granted to a person of the age x is made at the age $x+1$; the column N having been so tabulated that in all cases the numbers must be taken against the age at which the first payment is to be made.

- (8.) $\frac{N_{x+1} - N_{x+1+n}}{D_x} =$ Present Value of an annuity of £1 for the next n years.
- (9.) $\frac{N_x - N_{x+n}}{D_x} =$ Present Value of an annuity of £1 for the next n years, the payments being made at the beginning of each year.
- (10.) $\frac{N_{x+n}}{D_x} =$ Present Value of an annuity of £1, deferred for n years, the first payment being due at the age $x+n$.
- (11.) $\frac{N_{x+n} - \frac{m-1}{2m} \cdot D_{x+n}}{D_x} =$ Present Value of an annuity of £1 deferred for n years, and then made payable by m equal instalments in each year, the first payment of $\frac{1}{m}$ being due at the age $x+n$.
- (12.) $\frac{N_{x+n} - \frac{m-1}{2m} \cdot D_{x+n}}{N_x - N_{x+n}} =$ Annual Premium for the same.
- (13.) $\frac{N_{x+n} - \frac{m-1}{2m} \cdot D_{x+n}}{D_x + M_{x+n} - M_x} =$ Present Value of the same annuity, with return of premium should the life fail within n years.
- (14.) $\frac{N_{x+n} - \frac{m-1}{2m} \cdot D_{x+n}}{N_x + R_{x+n} + n M_{x+n} - N_{x+n} - R_x} =$ Annual Premium for the same annuity, with return of premiums should the life fail within n years.
- (15.) $\frac{N_{x+1+n} + \frac{m-1}{2m} \cdot D_{x+n}}{D_x} =$ Present Value of an annuity of £1 deferred for n years, and then made payable by m equal instalments in each year, the first payment of $\frac{1}{m}$ being due at the $\frac{1}{m}$ th part of a year after the deferred period has expired.
- (16.) $\frac{N_{x+1+n} + \frac{m-1}{2m} \cdot D_{x+n}}{N_x - N_{x+n}} =$ Annual Premium for the same.
- (17.) $\frac{N_{x+1+n} + \frac{m-1}{2m} \cdot D_{x+n}}{D_x + M_{x+n} - M_x} =$ Present Value of the same annuity, with return of premium should the life fail within n years.

$$(18.) \frac{N_{x+1+n} + \frac{n-1}{2n} \cdot D_{x+n}}{N_x + R_{x+n} + nM_{x+n} - N_{x+n} - R_x} = \text{Annual Premium for the same annuity, with return of premiums should the life fail within } n \text{ years.}$$

III. INCREASING AND DECREASING ANNUITIES.

$$(19.) \frac{S_{x+1}}{D_x} = \text{Present Value of an annuity of } \pounds 1, \text{ increasing } \pounds 1 \text{ annually during life, the first payment being due one year hence.}$$

$$(20.) \frac{S_{x+1} - S_{x+1+n}}{D_x} = \frac{S_{x+1:n}}{D_x} = \text{Present Value of an annuity of } \pounds 1, \text{ increasing annually by } \pounds 1 \text{ for } n \text{ years, and then continuing constant at } \pounds n \text{ during the remainder of life.}$$

$$(21.) \frac{S_{x+1} - S_{x+1+n} - nN_{x+1+n}}{D_x} = \text{Present Value of an annuity of } \pounds 1, \text{ increasing annually by } \pounds 1 \text{ for } n \text{ years, when the annuity ceases.}$$

$$(22.) \frac{nN_{x+1} + S_{x+1+n} - S_{x+1}}{D_x} = \text{Present Value of an annuity for } n \text{ years, commencing at } \pounds n, \text{ and decreasing by } \pounds 1 \text{ annually until the end of the term.}$$

$$(23.) \frac{(a-b)N_{x+1:n} + b(S_{x+1:n} - nN_{x+1+n})}{D_x} = \text{Present Value of an annuity for } n \text{ years, commencing at } \pounds a, \text{ and increasing by } \pounds b \text{ annually until the end of the term.}$$

$$(24.) \frac{(a+b)N_{x+1:n} - b(S_{x+1:n} - nN_{x+1+n})}{D_x} = \text{Present Value of an annuity for } n \text{ years, commencing at } \pounds a, \text{ and decreasing by } \pounds b \text{ annually until the end of the term.}$$

$$(25.) \frac{N_x + q(N_{x+n} + N_{x+2n} + \dots + N_{x+rn})}{D_x} = \text{Present Value of an annuity of } \pounds 1 \text{ for the first } n \text{ years, increasing by } \pounds q \text{ after each of } r \text{ intervals of } n \text{ years, and thereafter continuing constant at } \pounds 1 + rq, \text{ or}$$

Annuity 1st n years.	Annuity 2d n years.	Annuity 3d n years.	Annuity Rem. of life after rn years.
$\pounds 1$	$\pounds 1 + q$	$\pounds 1 + 2q$	$\dots \pounds 1 + rq$

$$(26.) \frac{N_x - q(N_{x+n} + N_{x+2n} + \dots + N_{x+rn})}{D_x} = \text{Present Value of an annuity of } \pounds 1 \text{ for the first } n \text{ years, decreasing by } \pounds q \text{ after each of } r \text{ intervals of } n \text{ years, and thereafter continuing constant at } \pounds 1 - rq, \text{ or}$$

Annuity 1st n years.	Annuity 2d n years.	Annuity 3d n years.	Annuity Rem. of life, after rn years.
$\pounds 1$	$\pounds 1 - q$	$\pounds 1 - 2q$	$\pounds 1 - rq$

NOTE.—In this case q must be less than $\frac{1}{r}$, otherwise the annuity will be exhausted in rn years.

IV. ASSURANCES FOR THE WHOLE OF LIFE.

$$(27.) \frac{M_x}{D_x} = \text{Single premium for an Assurance of } \pounds 1, \text{ payable at the end of the year in which a life } (x) \text{ shall fail.}$$

$$= 1 - \frac{d \cdot N_x}{D_x}$$

$$(28.) \frac{M_x}{N_x} = \text{Annual Premium for the same.}$$

$$= v - \frac{N_{x+1}}{N_x} = \frac{D_x}{N_x} - d = \frac{1}{1+a_x} - d.$$

$$(29.) \frac{M_x}{N_x - N_{x+n}} = \frac{M_x}{N_{x|n}} = \text{Annual Premium for the same, consisting of } n \text{ payments.}$$

$$(30.) \frac{M_x}{N_x + q(N_{x+n} + N_{x+2n} + \dots + N_{x+rn})} = p, \text{ the Annual Premium for the first } n \text{ years, increasing by } pq \text{ after each of } r \text{ intervals of } n \text{ years, and thereafter continuing constant at } p + rpq, \text{ for an assurance of } \pounds 1 \text{ on a single life.}$$

$$(31.) \frac{M_x}{N_x - q(N_{x+n} + N_{x+2n} + \dots + N_{x+rn})} = p, \text{ the Annual Premium for the first } n \text{ years, decreasing by } pq \text{ after each of } r \text{ intervals of } n \text{ years, and thereafter continuing constant at } p - rpq, \text{ for an assurance of } \pounds 1 \text{ on a single life.}$$

NOTE.—The value of q here must be less than $\frac{1}{r}$, unless the premiums are intended to be exhausted in rn years.

$$(32.) \frac{M_x}{N_x - \frac{1}{n}(S_{x+1} - S_{x+1+n})} = \text{The First Premium to be required for the Assurance of } \pounds 1, \text{ if the subsequent annual payments be reduced by the } n\text{th part of the first premium until they altogether cease after } n \text{ payments.}$$

$$(33.) \frac{M_x}{D_x - M_x} = \text{Present Value of an Assurance of } \pounds 1, \text{ payable at the end of the year in which a life } (x) \text{ shall fail, with a return of the premium paid.}$$

$$(34.) \frac{M_x}{N_x - R_x} = \text{Annual Premium for the same, with return of all the premiums paid.}$$

$$= \frac{P - a_x}{1 + a_x + \bar{I}a_x} \text{ (Prof. DE MORGAN.)}$$

REMARK.—By substituting R_x for M_x in the numerators of the above formulæ, similar results for *Increasing* Assurances will be obtained.

$$(35.) \frac{(a-b)M_x + bR_x}{D_x} = \text{Present Value of an Increasing Assurance for the whole term of life, commencing at } \pounds a, \text{ and increasing } \pounds b \text{ each year.}$$

$$(36.) \frac{(a-b)M_x + bR_x}{N_x} = \text{Annual Premium for the same.}$$

$$(37.) \frac{(a+b)M_x - bR_x}{D_x} = \text{Present Value of a Decreasing Assurance for the whole term of life, commencing at } \pounds a, \text{ and decreasing } \pounds b \text{ each year.}$$

$$(38.) \frac{(a+b)M_x - bR_x}{N_x} = \text{Annual Premium for the same.}$$

V. TEMPORARY ASSURANCES.

$$(39.) \frac{M_x - M_{x+n}}{D_x} \text{ or } \frac{M_{x:n}}{D_x} = \text{Present Value of an Assurance of } \pounds 1 \text{ for } n \text{ years on a life aged } x.$$

$$= \frac{vN_{x:n} - N_{x+1:n}}{D_x}$$

$$(40.) \frac{M_{x:n}}{N_{x:n}} = \text{Annual Premium for the same.}$$

$$= v - \frac{N_{x+1:n}}{N_{x:n}}$$

VI. DEFERRED ASSURANCES.

$$(41.) \frac{M_{x+n}}{D_x} = \text{Present Value of an Assurance of } \text{£}1 \text{ on a life aged } x, \text{ deferred for } n \text{ years.}$$

$$= \frac{D_{x+n} - d \cdot N_{x+n}}{D_x}$$

$$(42.) \frac{M_{x+n}}{N_x - N_{x+n}} = \text{Annual Premium for the same, payable for } n \text{ years.}$$

$$= \frac{D_{x+n} - d \cdot N_{x+n}}{N_x - N_{x+n}}$$

$$(43.) \frac{M_{x+n}}{N_x} = \text{Annual Premium for the same, payable for the whole of life.}$$

$$= \frac{D_{x+n} - d \cdot N_{x+n}}{N_x}$$

$$(44.) \frac{M_{x+n}}{D_x + M_{x+n} - M_x} = \text{Present Value of an Assurance of } \text{£}1 \text{ on a life aged } x \text{ deferred for } n \text{ years, with return of premium should the life fail before the } n \text{ years expire.}$$

$$(45.) \frac{M_{x+n}}{N_x + R_{x+n} + nM_{x+n} - N_{x+n} - R_x} = \text{Annual Premium for the same, payable for } n \text{ years, with return of premiums should the life fail within that term.}$$

REMARK.—By substituting R_{x+n} for M_{x+n} in the numerators of the above formulæ, similar results for *Increasing* Assurances will be obtained.

VII. VALUE OF POLICIES.

(46.) $1 - \frac{D_x \cdot N_{x+n}}{D_{x+n} \cdot N_x}$ = Value of a Policy of Assurance for £1 at the end of n years from the date of the assurance, when the $(n+1)$ th premium is just due.

$$\begin{aligned} &= A_{x+n} - p_x \times \overline{1+a_{x+n}} \\ &= (p_{x+n} - p_x) \times \overline{1+a_{x+n}} \end{aligned} \left. \vphantom{\begin{aligned} &= A_{x+n} - p_x \times \overline{1+a_{x+n}} \\ &= (p_{x+n} - p_x) \times \overline{1+a_{x+n}} \end{aligned}} \right\} \text{MILNE.}$$

$$= 1 - \frac{1+a_{x+n}}{1+a_x} \quad \text{. . . DAVIES.}$$

$$= 1 - \frac{1-A_{x+n}}{1-A_x} \quad \text{. . . FARREN.}$$

(47.) $v - \frac{D_x \cdot N_{x+1+n}}{D_{x+n} \cdot N_x}$ = Value of the same Policy when the $(n+1)$ th premium is just paid.

$$= v - \frac{a_{x+n}}{1+a_x}$$

VIII. TWO JOINT LIVES.

(48.) $\frac{N_{x,y+1}}{D_{x,y}}$ = Value of an Annuity of £1 on two Joint Lives (x) and (y).

(49.) $\frac{N_{x,y+1} - N_{x,y+1+n}}{D_{x,y}}$ or $\frac{N_{x,y+1|n}}{D_{x,y}}$ = Value of an Annuity of £1 on two Joint Lives for n years.

(50.) $\frac{N_{x,y+n}}{D_{x,y}}$ = Value of an Annuity of £1 on two Joint Lives (x) and (y), the first payment of which is to be made in n years.

REMARK.—Many of the same questions for two Joint Lives may be solved from the previous formulæ, by substituting $D_{x,y}$ for D_x and $N_{x,y}$ for N_x .

ERRATA IN JONES' TABLES.

A comparison having been made of the Commutation Tables for Joint Annuities with the corresponding Tables in the late Mr. David Jones' Treatise on Annuities and Reversionary Payments, the following differences have been discovered, which appear to be errors in Mr. Jones' Tables, and should therefore be corrected with the pen.

I. ERRORS IN THE D COLUMN WHICH AFFECT THE N COLUMN, AND ALL VALUES ABOVE IT.

D _{39.39} , page 559,	8329103.8	should be	8329102.8,	at 3 per cent.
D _{87.96} , " 567,	485.6448	"	535.6443,	"
D _{23.35} , " 571,	11862898.8	"	11862898.8,	"
D _{17.36} , " 578,	11886580.6	"	11887530.6,	"
D _{9.56} , " 600,	4961539.8	"	4961539.8,	"
D _{16.73} , " 606,	1597397.0	"	1597297.0,	"
D _{78.100} , " 681,	330.0002	"	850.0002,	at 3½ per cent.
D _{28.89} , " 648,	1872487.4	"	1872037.4,	"
D _{6.59} , " 654,	8288148.5	"	8288148.3,	"
D _{17.21} , " 768,	18498591.4	"	18498491.4,	at 5 per cent.
D _{6.28} , " 780,	9788883.5	"	9788873.5,	"
D _{31.90} , " 808,	9823.58	"	9823.68,	"
D _{11.18} , " 816,	18814904.1	"	18814904.1,	at 6 per cent.
D _{34.48} , " 823,	1492866.6	"	1493866.6,	"
D _{46.69} , " 882,	210950.5	"	210990.5,	"
D _{19.53} , " 841,	1177182.2	"	1177192.2,	"

II. ERRORS IN THE N COLUMN CARRIED UPWARDS IN THE SUMMATION.

N _{5.24} , page 578,	359742564.3	should be	359743584.3,	at 3 per cent.
N _{37.80} , " 648,	1291223.12	"	1291823.12,	at 3½ per cent.
N _{75.94} , " 678,	3383.425	"	3183.425,	at 4 per cent.
N _{34.94} , " 808,	11479.890	"	5479.890,	at 5 per cent.
N _{62.74} , " 821,	386280.8	"	386290.8,	at 6 per cent.
N _{7.23} , " 825,	128295684.3	"	128195684.3,	"
N _{42.67} , " 884,	1711630.9	"	1711730.9,	"

III. ERRORS OF THE PRESS.

D _{84.87} , page 612,	781.215	should be	7851.215,	at 3½ per cent.
D _{22.31} , " 668,	9942602.0	"	9942662.0,	at 4 per cent.
N _{49.97} , " 851,	642.270	"	642.210,	at 6 per cent.

MONETARY TABLES.

TABLE I.

THE DECIMAL PARTS OF £1, CORRESPONDING TO ANY NUMBER OF SHILLINGS,
PENCE, AND FARTHING.

s. d.	Decimal.	s. d.	Decimal.	s. d.	Decimal.	s. d.	Decimal.
0 0½	.0010417	1 0½	.0510417	2 0½	.1010417	3 0½	.1510417
0 0¾	.0020833	1 0¾	.0520833	2 0¾	.1020833	3 0¾	.1520833
0 0⅞	.0031250	1 0⅞	.0531250	2 0⅞	.1031250	3 0⅞	.1531250
0 1	.0041667	1 1	.0541667	2 1	.1041667	3 1	.1541667
0 1½	.0052083	1 1½	.0552083	2 1½	.1052083	3 1½	.1552083
0 1¾	.0062500	1 1¾	.0562500	2 1¾	.1062500	3 1¾	.1562500
0 1⅞	.0072917	1 1⅞	.0572917	2 1⅞	.1072917	3 1⅞	.1572917
0 2	.0083333	1 2	.0583333	2 2	.1083333	3 2	.1583333
0 2½	.0093750	1 2½	.0593750	2 2½	.1093750	3 2½	.1593750
0 2¾	.0104167	1 2¾	.0604167	2 2¾	.1104167	3 2¾	.1604167
0 2⅞	.0114583	1 2⅞	.0614583	2 2⅞	.1114583	3 2⅞	.1614583
0 3	.0125000	1 3	.0625000	2 3	.1125000	3 3	.1625000
0 3½	.0135417	1 3½	.0635417	2 3½	.1135417	3 3½	.1635417
0 3¾	.0145833	1 3¾	.0645833	2 3¾	.1145833	3 3¾	.1645833
0 3⅞	.0156250	1 3⅞	.0656250	2 3⅞	.1156250	3 3⅞	.1656250
0 4	.0166667	1 4	.0666667	2 4	.1166667	3 4	.1666667
0 4½	.0177083	1 4½	.0677083	2 4½	.1177083	3 4½	.1677083
0 4¾	.0187500	1 4¾	.0687500	2 4¾	.1187500	3 4¾	.1687500
0 4⅞	.0197917	1 4⅞	.0697917	2 4⅞	.1197917	3 4⅞	.1697917
0 5	.0208333	1 5	.0708333	2 5	.1208333	3 5	.1708333
0 5½	.0218750	1 5½	.0718750	2 5½	.1218750	3 5½	.1718750
0 5¾	.0229167	1 5¾	.0729167	2 5¾	.1229167	3 5¾	.1729167
0 5⅞	.0239583	1 5⅞	.0739583	2 5⅞	.1239583	3 5⅞	.1739583
0 6	.0250000	1 6	.0750000	2 6	.1250000	3 6	.1750000
0 6½	.0260417	1 6½	.0760417	2 6½	.1260417	3 6½	.1760417
0 6¾	.0270833	1 6¾	.0770833	2 6¾	.1270833	3 6¾	.1770833
0 6⅞	.0281250	1 6⅞	.0781250	2 6⅞	.1281250	3 6⅞	.1781250
0 7	.0291667	1 7	.0791667	2 7	.1291667	3 7	.1791667
0 7½	.0302083	1 7½	.0802083	2 7½	.1302083	3 7½	.1802083
0 7¾	.0312500	1 7¾	.0812500	2 7¾	.1312500	3 7¾	.1812500
0 7⅞	.0322917	1 7⅞	.0822917	2 7⅞	.1322917	3 7⅞	.1822917
0 8	.0333333	1 8	.0833333	2 8	.1333333	3 8	.1833333
0 8½	.0343750	1 8½	.0843750	2 8½	.1343750	3 8½	.1843750
0 8¾	.0354167	1 8¾	.0854167	2 8¾	.1354167	3 8¾	.1854167
0 8⅞	.0364583	1 8⅞	.0864583	2 8⅞	.1364583	3 8⅞	.1864583
0 9	.0375000	1 9	.0875000	2 9	.1375000	3 9	.1875000
0 9½	.0385417	1 9½	.0885417	2 9½	.1385417	3 9½	.1885417
0 9¾	.0395833	1 9¾	.0895833	2 9¾	.1395833	3 9¾	.1895833
0 9⅞	.0406250	1 9⅞	.0906250	2 9⅞	.1406250	3 9⅞	.1906250
0 10	.0416667	1 10	.0916667	2 10	.1416667	3 10	.1916667
0 10½	.0427083	1 10½	.0927083	2 10½	.1427083	3 10½	.1927083
0 10¾	.0437500	1 10¾	.0937500	2 10¾	.1437500	3 10¾	.1937500
0 10⅞	.0447917	1 10⅞	.0947917	2 10⅞	.1447917	3 10⅞	.1947917
0 11	.0458333	1 11	.0958333	2 11	.1458333	3 11	.1958333
0 11½	.0468750	1 11½	.0968750	2 11½	.1468750	3 11½	.1968750
0 11¾	.0479167	1 11¾	.0979167	2 11¾	.1479167	3 11¾	.1979167
0 11⅞	.0489583	1 11⅞	.0989583	2 11⅞	.1489583	3 11⅞	.1989583
1 0	.0500000	2 0	.1000000	3 0	.1500000	4 0	.2000000

TABLE I.

THE DECIMAL PARTS OF £1, CORRESPONDING TO ANY NUMBER OF SHILLINGS,
PENCE, AND FARTHING.

s. d.	Decimal.	s. d.	Decimal.	s. d.	Decimal.	s. d.	Decimal.
4 0 $\frac{1}{4}$	.2010417	5 0 $\frac{1}{4}$	.2510417	6 0 $\frac{1}{4}$	.3010417	7 0 $\frac{1}{4}$	.3510417
4 0 $\frac{1}{2}$	.2020833	5 0 $\frac{1}{2}$	.2520833	6 0 $\frac{1}{2}$	.3020833	7 0 $\frac{1}{2}$	.3520833
4 0 $\frac{3}{4}$	.2031250	5 0 $\frac{3}{4}$	.2531250	6 0 $\frac{3}{4}$	.3031250	7 0 $\frac{3}{4}$	.3531250
4 1	.2041667	5 1	.2541667	6 1	.3041667	7 1	.3541667
4 1 $\frac{1}{4}$	.2052083	5 1 $\frac{1}{4}$	.2552083	6 1 $\frac{1}{4}$	.3052083	7 1 $\frac{1}{4}$	.3552083
4 1 $\frac{1}{2}$	.2062500	5 1 $\frac{1}{2}$	.2562500	6 1 $\frac{1}{2}$	.3062500	7 1 $\frac{1}{2}$	.3562500
4 1 $\frac{3}{4}$	.2072917	5 1 $\frac{3}{4}$	.2572917	6 1 $\frac{3}{4}$	.3072917	7 1 $\frac{3}{4}$	.3572917
4 2	.2083333	5 2	.2583333	6 2	.3083333	7 2	.3583333
4 2 $\frac{1}{4}$	.2093750	5 2 $\frac{1}{4}$	.2593750	6 2 $\frac{1}{4}$	.3093750	7 2 $\frac{1}{4}$	.3593750
4 2 $\frac{1}{2}$	.2104167	5 2 $\frac{1}{2}$	.2604167	6 2 $\frac{1}{2}$	.3104167	7 2 $\frac{1}{2}$	.3604167
4 2 $\frac{3}{4}$	.2114583	5 2 $\frac{3}{4}$	.2614583	6 2 $\frac{3}{4}$	.3114583	7 2 $\frac{3}{4}$	.3614583
4 3	.2125000	5 3	.2625000	6 3	.3125000	7 3	.3625000
4 3 $\frac{1}{4}$	.2135417	5 3 $\frac{1}{4}$	.2635417	6 3 $\frac{1}{4}$	.3135417	7 3 $\frac{1}{4}$	.3635417
4 3 $\frac{1}{2}$	.2145833	5 3 $\frac{1}{2}$	.2645833	6 3 $\frac{1}{2}$	.3145833	7 3 $\frac{1}{2}$	.3645833
4 3 $\frac{3}{4}$	.2156250	5 3 $\frac{3}{4}$	.2656250	6 3 $\frac{3}{4}$	.3156250	7 3 $\frac{3}{4}$	.3656250
4 4	.2166667	5 4	.2666667	6 4	.3166667	7 4	.3666667
4 4 $\frac{1}{4}$	.2177083	5 4 $\frac{1}{4}$	.2677083	6 4 $\frac{1}{4}$	.3177083	7 4 $\frac{1}{4}$	.3677083
4 4 $\frac{1}{2}$	.2187500	5 4 $\frac{1}{2}$	.2687500	6 4 $\frac{1}{2}$	.3187500	7 4 $\frac{1}{2}$	.3687500
4 4 $\frac{3}{4}$	.2197917	5 4 $\frac{3}{4}$	.2697917	6 4 $\frac{3}{4}$	.3197917	7 4 $\frac{3}{4}$	.3697917
4 5	.2208333	5 5	.2708333	6 5	.3208333	7 5	.3708333
4 5 $\frac{1}{4}$	.2218750	5 5 $\frac{1}{4}$	.2718750	6 5 $\frac{1}{4}$	.3218750	7 5 $\frac{1}{4}$	.3718750
4 5 $\frac{1}{2}$	.2229167	5 5 $\frac{1}{2}$	.2729167	6 5 $\frac{1}{2}$	.3229167	7 5 $\frac{1}{2}$	.3729167
4 5 $\frac{3}{4}$	.2239583	5 5 $\frac{3}{4}$	.2739583	6 5 $\frac{3}{4}$	.3239583	7 5 $\frac{3}{4}$	.3739583
4 6	.2250000	5 6	.2750000	6 6	.3250000	7 6	.3750000
4 6 $\frac{1}{4}$	.2260417	5 6 $\frac{1}{4}$	.2760417	6 6 $\frac{1}{4}$	.3260417	7 6 $\frac{1}{4}$	.3760417
4 6 $\frac{1}{2}$	.2270833	5 6 $\frac{1}{2}$	.2770833	6 6 $\frac{1}{2}$	.3270833	7 6 $\frac{1}{2}$	.3770833
4 6 $\frac{3}{4}$	.2281250	5 6 $\frac{3}{4}$	.2781250	6 6 $\frac{3}{4}$	.3281250	7 6 $\frac{3}{4}$	.3781250
4 7	.2291667	5 7	.2791667	6 7	.3291667	7 7	.3791667
4 7 $\frac{1}{4}$	.2302083	5 7 $\frac{1}{4}$	.2802083	6 7 $\frac{1}{4}$	.3302083	7 7 $\frac{1}{4}$	.3802083
4 7 $\frac{1}{2}$	.2312500	5 7 $\frac{1}{2}$	.2812500	6 7 $\frac{1}{2}$	.3312500	7 7 $\frac{1}{2}$	.3812500
4 7 $\frac{3}{4}$	.2322917	5 7 $\frac{3}{4}$	.2822917	6 7 $\frac{3}{4}$	.3322917	7 7 $\frac{3}{4}$	.3822917
4 8	.2333333	5 8	.2833333	6 8	.3333333	7 8	.3833333
4 8 $\frac{1}{4}$	.2343750	5 8 $\frac{1}{4}$	.2843750	6 8 $\frac{1}{4}$	.3343750	7 8 $\frac{1}{4}$	.3843750
4 8 $\frac{1}{2}$	.2354167	5 8 $\frac{1}{2}$	.2854167	6 8 $\frac{1}{2}$	.3354167	7 8 $\frac{1}{2}$	.3854167
4 8 $\frac{3}{4}$	.2364583	5 8 $\frac{3}{4}$	.2864583	6 8 $\frac{3}{4}$	.3364583	7 8 $\frac{3}{4}$	.3864583
4 9	.2375000	5 9	.2875000	6 9	.3375000	7 9	.3875000
4 9 $\frac{1}{4}$	.2385417	5 9 $\frac{1}{4}$	.2885417	6 9 $\frac{1}{4}$	.3385417	7 9 $\frac{1}{4}$	.3885417
4 9 $\frac{1}{2}$	.2395833	5 9 $\frac{1}{2}$	.2895833	6 9 $\frac{1}{2}$	.3395833	7 9 $\frac{1}{2}$	.3895833
4 9 $\frac{3}{4}$	.2406250	5 9 $\frac{3}{4}$	.2906250	6 9 $\frac{3}{4}$	.3406250	7 9 $\frac{3}{4}$	.3906250
4 10	.2416667	5 10	.2916667	6 10	.3416667	7 10	.3916667
4 10 $\frac{1}{4}$	.2427083	5 10 $\frac{1}{4}$	.2927083	6 10 $\frac{1}{4}$	.3427083	7 10 $\frac{1}{4}$	.3927083
4 10 $\frac{1}{2}$	.2437500	5 10 $\frac{1}{2}$	.2937500	6 10 $\frac{1}{2}$	.3437500	7 10 $\frac{1}{2}$	.3937500
4 10 $\frac{3}{4}$	.2447917	5 10 $\frac{3}{4}$	.2947917	6 10 $\frac{3}{4}$	.3447917	7 10 $\frac{3}{4}$	.3947917
4 11	.2458333	5 11	.2958333	6 11	.3458333	7 11	.3958333
4 11 $\frac{1}{4}$	.2468750	5 11 $\frac{1}{4}$	.2968750	6 11 $\frac{1}{4}$	.3468750	7 11 $\frac{1}{4}$	.3968750
4 11 $\frac{1}{2}$	.2479167	5 11 $\frac{1}{2}$	.2979167	6 11 $\frac{1}{2}$	.3479167	7 11 $\frac{1}{2}$	.3979167
4 11 $\frac{3}{4}$	.2489583	5 11 $\frac{3}{4}$	.2989583	6 11 $\frac{3}{4}$	.3489583	7 11 $\frac{3}{4}$	.3989583
5 0	.2500000	6 0	.3000000	7 0	.3500000	8 0	.4000000

TABLE I.

THE DECIMAL PARTS OF £1, CORRESPONDING TO ANY NUMBER OF SHILLINGS,
PENCE, AND FARTHING.

s. d.	Decimal.	s. d.	Decimal.	s. d.	Decimal.	s. d.	Decimal.
8 0 $\frac{1}{4}$	.4010417	9 0 $\frac{1}{4}$	.4510417	10 0 $\frac{1}{4}$	.5010417	11 0 $\frac{1}{4}$	.5510417
8 0 $\frac{1}{2}$	.4020833	9 0 $\frac{1}{2}$	.4520833	10 0 $\frac{1}{2}$	.5020833	11 0 $\frac{1}{2}$	.5520833
8 0 $\frac{3}{4}$	.4031250	9 0 $\frac{3}{4}$	.4531250	10 0 $\frac{3}{4}$	.5031250	11 0 $\frac{3}{4}$	.5531250
8 1	.4041667	9 1	.4541667	10 1	.5041667	11 1	.5541667
8 1 $\frac{1}{4}$	.4052083	9 1 $\frac{1}{4}$	.4552083	10 1 $\frac{1}{4}$	.5052083	11 1 $\frac{1}{4}$	.5552083
8 1 $\frac{1}{2}$	.4062500	9 1 $\frac{1}{2}$	.4562500	10 1 $\frac{1}{2}$	.5062500	11 1 $\frac{1}{2}$	.5562500
8 1 $\frac{3}{4}$	.4072917	9 1 $\frac{3}{4}$	.4572917	10 1 $\frac{3}{4}$	.5072917	11 1 $\frac{3}{4}$	.5572917
8 2	.4083333	9 2	.4583333	10 2	.5083333	11 2	.5583333
8 2 $\frac{1}{4}$	.4093750	9 2 $\frac{1}{4}$	.4593750	10 2 $\frac{1}{4}$	.5093750	11 2 $\frac{1}{4}$	.5593750
8 2 $\frac{1}{2}$	.4104167	9 2 $\frac{1}{2}$	.4604167	10 2 $\frac{1}{2}$	.5104167	11 2 $\frac{1}{2}$	.5604167
8 2 $\frac{3}{4}$	.4114583	9 2 $\frac{3}{4}$	.4614583	10 2 $\frac{3}{4}$	.5114583	11 2 $\frac{3}{4}$	.5614583
8 3	.4125000	9 3	.4625000	10 3	.5125000	11 3	.5625000
8 3 $\frac{1}{4}$	.4135417	9 3 $\frac{1}{4}$	.4635417	10 3 $\frac{1}{4}$	.5135417	11 3 $\frac{1}{4}$	.5635417
8 3 $\frac{1}{2}$	.4145833	9 3 $\frac{1}{2}$	.4645833	10 3 $\frac{1}{2}$	.5145833	11 3 $\frac{1}{2}$	.5645833
8 3 $\frac{3}{4}$	.4156250	9 3 $\frac{3}{4}$	.4656250	10 3 $\frac{3}{4}$	.5156250	11 3 $\frac{3}{4}$	.5656250
8 4	.4166667	9 4	.4666667	10 4	.5166667	11 4	.5666667
8 4 $\frac{1}{4}$	.4177083	9 4 $\frac{1}{4}$	.4677083	10 4 $\frac{1}{4}$	.5177083	11 4 $\frac{1}{4}$	.5677083
8 4 $\frac{1}{2}$	.4187500	9 4 $\frac{1}{2}$	.4687500	10 4 $\frac{1}{2}$	.5187500	11 4 $\frac{1}{2}$	.5687500
8 4 $\frac{3}{4}$	.4197917	9 4 $\frac{3}{4}$	.4697917	10 4 $\frac{3}{4}$	.5197917	11 4 $\frac{3}{4}$	.5697917
8 5	.4208333	9 5	.4708333	10 5	.5208333	11 5	.5708333
8 5 $\frac{1}{4}$	.4218750	9 5 $\frac{1}{4}$	.4718750	10 5 $\frac{1}{4}$	.5218750	11 5 $\frac{1}{4}$	.5718750
8 5 $\frac{1}{2}$	.4229167	9 5 $\frac{1}{2}$	.4729167	10 5 $\frac{1}{2}$	.5229167	11 5 $\frac{1}{2}$	.5729167
8 5 $\frac{3}{4}$	.4239583	9 5 $\frac{3}{4}$	.4739583	10 5 $\frac{3}{4}$	.5239583	11 5 $\frac{3}{4}$	.5739583
8 6	.4250000	9 6	.4750000	10 6	.5250000	11 6	.5750000
8 6 $\frac{1}{4}$	.4260417	9 6 $\frac{1}{4}$	.4760417	10 6 $\frac{1}{4}$	.5260417	11 6 $\frac{1}{4}$	.5760417
8 6 $\frac{1}{2}$	.4270833	9 6 $\frac{1}{2}$	.4770833	10 6 $\frac{1}{2}$	.5270833	11 6 $\frac{1}{2}$	.5770833
8 6 $\frac{3}{4}$	.4281250	9 6 $\frac{3}{4}$	.4781250	10 6 $\frac{3}{4}$	.5281250	11 6 $\frac{3}{4}$	.5781250
8 7	.4291667	9 7	.4791667	10 7	.5291667	11 7	.5791667
8 7 $\frac{1}{4}$	.4302083	9 7 $\frac{1}{4}$	.4802083	10 7 $\frac{1}{4}$	.5302083	11 7 $\frac{1}{4}$	.5802083
8 7 $\frac{1}{2}$	.4312500	9 7 $\frac{1}{2}$	.4812500	10 7 $\frac{1}{2}$	.5312500	11 7 $\frac{1}{2}$	.5812500
8 7 $\frac{3}{4}$	.4322917	9 7 $\frac{3}{4}$	.4822917	10 7 $\frac{3}{4}$	.5322917	11 7 $\frac{3}{4}$	.5822917
8 8	.4333333	9 8	.4833333	10 8	.5333333	11 8	.5833333
8 8 $\frac{1}{4}$	.4343750	9 8 $\frac{1}{4}$	.4843750	10 8 $\frac{1}{4}$	.5343750	11 8 $\frac{1}{4}$	.5843750
8 8 $\frac{1}{2}$	.4354167	9 8 $\frac{1}{2}$	.4854167	10 8 $\frac{1}{2}$	.5354167	11 8 $\frac{1}{2}$	.5854167
8 8 $\frac{3}{4}$	.4364583	9 8 $\frac{3}{4}$	.4864583	10 8 $\frac{3}{4}$	.5364583	11 8 $\frac{3}{4}$	.5864583
8 9	.4375000	9 9	.4875000	10 9	.5375000	11 9	.5875000
8 9 $\frac{1}{4}$	.4385417	9 9 $\frac{1}{4}$	.4885417	10 9 $\frac{1}{4}$	.5385417	11 9 $\frac{1}{4}$	.5885417
8 9 $\frac{1}{2}$	.4395833	9 9 $\frac{1}{2}$	.4895833	10 9 $\frac{1}{2}$	.5395833	11 9 $\frac{1}{2}$	.5895833
8 9 $\frac{3}{4}$	.4406250	9 9 $\frac{3}{4}$	.4906250	10 9 $\frac{3}{4}$	.5406250	11 9 $\frac{3}{4}$	.5906250
8 10	.4416667	9 10	.4916667	10 10	.5416667	11 10	.5916667
8 10 $\frac{1}{4}$	.4427083	9 10 $\frac{1}{4}$	.4927083	10 10 $\frac{1}{4}$	.5427083	11 10 $\frac{1}{4}$	.5927083
8 10 $\frac{1}{2}$	.4437500	9 10 $\frac{1}{2}$	.4937500	10 10 $\frac{1}{2}$	.5437500	11 10 $\frac{1}{2}$	.5937500
8 10 $\frac{3}{4}$	.4447917	9 10 $\frac{3}{4}$	.4947917	10 10 $\frac{3}{4}$	.5447917	11 10 $\frac{3}{4}$	.5947917
8 11	.4458333	9 11	.4958333	10 11	.5458333	11 11	.5958333
8 11 $\frac{1}{4}$	.4468750	9 11 $\frac{1}{4}$	.4968750	10 11 $\frac{1}{4}$	.5468750	11 11 $\frac{1}{4}$	.5968750
8 11 $\frac{1}{2}$	.4479167	9 11 $\frac{1}{2}$	.4979167	10 11 $\frac{1}{2}$	.5479167	11 11 $\frac{1}{2}$	.5979167
8 11 $\frac{3}{4}$	.4489583	9 11 $\frac{3}{4}$	.4989583	10 11 $\frac{3}{4}$	.5489583	11 11 $\frac{3}{4}$	.5989583
9 0	.4500000	10 0	.5000000	11 0	.5500000	12 0	.6000000

TABLE I.

THE DECIMAL PARTS OF £1, CORRESPONDING TO ANY NUMBER OF SHILLINGS,
PENCE, AND FARTHING.

s. d.	Decimal.	s. d.	Decimal.	s. d.	Decimal.	s. d.	Decimal.
12 0 $\frac{1}{4}$	.6010417	13 0 $\frac{1}{4}$	.6510417	14 0 $\frac{1}{4}$	.7010417	15 0 $\frac{1}{4}$	.7510417
12 0 $\frac{1}{2}$	.6020833	13 0 $\frac{1}{2}$	.6520833	14 0 $\frac{1}{2}$	.7020833	15 0 $\frac{1}{2}$	.7520833
12 0 $\frac{3}{4}$	.6031250	13 0 $\frac{3}{4}$	.6531250	14 0 $\frac{3}{4}$	.7031250	15 0 $\frac{3}{4}$	.7531250
12 1	.6041667	13 1	.6541667	14 1	.7041667	15 1	.7541667
12 1 $\frac{1}{4}$	.6052083	13 1 $\frac{1}{4}$	.6552083	14 1 $\frac{1}{4}$	.7052083	15 1 $\frac{1}{4}$	.7552083
12 1 $\frac{1}{2}$	.6062500	13 1 $\frac{1}{2}$	.6562500	14 1 $\frac{1}{2}$	.7062500	15 1 $\frac{1}{2}$	.7562500
12 1 $\frac{3}{4}$	.6072917	13 1 $\frac{3}{4}$	.6572917	14 1 $\frac{3}{4}$	.7072917	15 1 $\frac{3}{4}$	.7572917
12 2	.6083333	13 2	.6583333	14 2	.7083333	15 2	.7583333
12 2 $\frac{1}{4}$	.6093750	13 2 $\frac{1}{4}$	.6593750	14 2 $\frac{1}{4}$	.7093750	15 2 $\frac{1}{4}$	.7593750
12 2 $\frac{1}{2}$	.6104167	13 2 $\frac{1}{2}$	.6604167	14 2 $\frac{1}{2}$	.7104167	15 2 $\frac{1}{2}$	.7604167
12 2 $\frac{3}{4}$	.6114583	13 2 $\frac{3}{4}$	.6614583	14 2 $\frac{3}{4}$	.7114583	15 2 $\frac{3}{4}$	.7614583
12 3	.6125000	13 3	.6625000	14 3	.7125000	15 3	.7625000
12 3 $\frac{1}{4}$	.6135417	13 3 $\frac{1}{4}$	.6635417	14 3 $\frac{1}{4}$	.7135417	15 3 $\frac{1}{4}$	.7635417
12 3 $\frac{1}{2}$	.6145833	13 3 $\frac{1}{2}$	.6645833	14 3 $\frac{1}{2}$	.7145833	15 3 $\frac{1}{2}$	.7645833
12 3 $\frac{3}{4}$	.6156250	13 3 $\frac{3}{4}$	.6656250	14 3 $\frac{3}{4}$	.7156250	15 3 $\frac{3}{4}$	.7656250
12 4	.6166667	13 4	.6666667	14 4	.7166667	15 4	.7666667
12 4 $\frac{1}{4}$	.6177083	13 4 $\frac{1}{4}$	.6677083	14 4 $\frac{1}{4}$	.7177083	15 4 $\frac{1}{4}$	.7677083
12 4 $\frac{1}{2}$	.6187500	13 4 $\frac{1}{2}$	.6687500	14 4 $\frac{1}{2}$	.7187500	15 4 $\frac{1}{2}$	.7687500
12 4 $\frac{3}{4}$	.6197917	13 4 $\frac{3}{4}$	.6697917	14 4 $\frac{3}{4}$	.7197917	15 4 $\frac{3}{4}$	.7697917
12 5	.6208333	13 5	.6708333	14 5	.7208333	15 5	.7708333
12 5 $\frac{1}{4}$	.6218750	13 5 $\frac{1}{4}$	.6718750	14 5 $\frac{1}{4}$	.7218750	15 5 $\frac{1}{4}$	.7718750
12 5 $\frac{1}{2}$	.6229167	13 5 $\frac{1}{2}$	.6729167	14 5 $\frac{1}{2}$	.7229167	15 5 $\frac{1}{2}$	.7729167
12 5 $\frac{3}{4}$	.6239583	13 5 $\frac{3}{4}$	.6739583	14 5 $\frac{3}{4}$	.7239583	15 5 $\frac{3}{4}$	.7739583
12 6	.6250000	13 6	.6750000	14 6	.7250000	15 6	.7750000
12 6 $\frac{1}{4}$	.6260417	13 6 $\frac{1}{4}$	.6760417	14 6 $\frac{1}{4}$	.7260417	15 6 $\frac{1}{4}$	.7760417
12 6 $\frac{1}{2}$	.6270833	13 6 $\frac{1}{2}$	.6770833	14 6 $\frac{1}{2}$	.7270833	15 6 $\frac{1}{2}$	.7770833
12 6 $\frac{3}{4}$	.6281250	13 6 $\frac{3}{4}$	.6781250	14 6 $\frac{3}{4}$	.7281250	15 6 $\frac{3}{4}$	.7781250
12 7	.6291667	13 7	.6791667	14 7	.7291667	15 7	.7791667
12 7 $\frac{1}{4}$	.6302083	13 7 $\frac{1}{4}$	.6802083	14 7 $\frac{1}{4}$	.7302083	15 7 $\frac{1}{4}$	.7802083
12 7 $\frac{1}{2}$	.6312500	13 7 $\frac{1}{2}$	.6812500	14 7 $\frac{1}{2}$	.7312500	15 7 $\frac{1}{2}$	.7812500
12 7 $\frac{3}{4}$	.6322917	13 7 $\frac{3}{4}$	.6822917	14 7 $\frac{3}{4}$	.7322917	15 7 $\frac{3}{4}$	.7822917
12 8	.6333333	13 8	.6833333	14 8	.7333333	15 8	.7833333
12 8 $\frac{1}{4}$	.6343750	13 8 $\frac{1}{4}$	.6843750	14 8 $\frac{1}{4}$	.7343750	15 8 $\frac{1}{4}$	.7843750
12 8 $\frac{1}{2}$	.6354167	13 8 $\frac{1}{2}$	.6854167	14 8 $\frac{1}{2}$	.7354167	15 8 $\frac{1}{2}$	.7854167
12 8 $\frac{3}{4}$	.6364583	13 8 $\frac{3}{4}$	.6864583	14 8 $\frac{3}{4}$	.7364583	15 8 $\frac{3}{4}$	.7864583
12 9	.6375000	13 9	.6875000	14 9	.7375000	15 9	.7875000
12 9 $\frac{1}{4}$	.6385417	13 9 $\frac{1}{4}$	.6885417	14 9 $\frac{1}{4}$	.7385417	15 9 $\frac{1}{4}$	.7885417
12 9 $\frac{1}{2}$	.6395833	13 9 $\frac{1}{2}$	.6895833	14 9 $\frac{1}{2}$	.7395833	15 9 $\frac{1}{2}$	.7895833
12 9 $\frac{3}{4}$	.6406250	13 9 $\frac{3}{4}$	.6906250	14 9 $\frac{3}{4}$	.7406250	15 9 $\frac{3}{4}$	.7906250
12 10	.6416667	13 10	.6916667	14 10	.7416667	15 10	.7916667
12 10 $\frac{1}{4}$	.6427083	13 10 $\frac{1}{4}$	.6927083	14 10 $\frac{1}{4}$	.7427083	15 10 $\frac{1}{4}$	.7927083
12 10 $\frac{1}{2}$	.6437500	13 10 $\frac{1}{2}$	.6937500	14 10 $\frac{1}{2}$	.7437500	15 10 $\frac{1}{2}$	.7937500
12 10 $\frac{3}{4}$	.6447917	13 10 $\frac{3}{4}$	.6947917	14 10 $\frac{3}{4}$	.7447917	15 10 $\frac{3}{4}$	.7947917
12 11	.6458333	13 11	.6958333	14 11	.7458333	15 11	.7958333
12 11 $\frac{1}{4}$	.6468750	13 11 $\frac{1}{4}$	.6968750	14 11 $\frac{1}{4}$	.7468750	15 11 $\frac{1}{4}$	.7968750
12 11 $\frac{1}{2}$	.6479167	13 11 $\frac{1}{2}$	.6979167	14 11 $\frac{1}{2}$	.7479167	15 11 $\frac{1}{2}$	.7979167
12 11 $\frac{3}{4}$	.6489583	13 11 $\frac{3}{4}$	.6989583	14 11 $\frac{3}{4}$	.7489583	15 11 $\frac{3}{4}$	.7989583
13 0	.6500000	14 0	.7000000	15 0	.7500000	16 0	.8000000

TABLE I.

THE DECIMAL PARTS OF £1, CORRESPONDING TO ANY NUMBER OF SHILLINGS,
PENCE, AND FARTHING.

s. d.	Decimal.	s. d.	Decimal.	s. d.	Decimal.	s. d.	Decimal.
16 0 $\frac{1}{4}$	.8010417	17 0 $\frac{1}{4}$	.8510417	18 0 $\frac{1}{4}$	.9010417	19 0 $\frac{1}{4}$	.9510417
16 0 $\frac{1}{2}$	.8020833	17 0 $\frac{1}{2}$	.8520833	18 0 $\frac{1}{2}$	.9020833	19 0 $\frac{1}{2}$	.9520833
16 0 $\frac{3}{4}$	.8031250	17 0 $\frac{3}{4}$	.8531250	18 0 $\frac{3}{4}$	.9031250	19 0 $\frac{3}{4}$	.9531250
16 1	.8041667	17 1	.8541667	18 1	.9041667	19 1	.9541667
16 1 $\frac{1}{4}$	.8052083	17 1 $\frac{1}{4}$	.8552083	18 1 $\frac{1}{4}$	.9052083	19 1 $\frac{1}{4}$	.9552083
16 1 $\frac{1}{2}$	.8062500	17 1 $\frac{1}{2}$	.8562500	18 1 $\frac{1}{2}$	.9062500	19 1 $\frac{1}{2}$	.9562500
16 1 $\frac{3}{4}$	.8072917	17 1 $\frac{3}{4}$	.8572917	18 1 $\frac{3}{4}$	.9072917	19 1 $\frac{3}{4}$	.9572917
16 2	.8083333	17 2	.8583333	18 2	.9083333	19 2	.9583333
16 2 $\frac{1}{4}$	.8093750	17 2 $\frac{1}{4}$	.8593750	18 2 $\frac{1}{4}$	.9093750	19 2 $\frac{1}{4}$	.9593750
16 2 $\frac{1}{2}$	.8104167	17 2 $\frac{1}{2}$	.8604167	18 2 $\frac{1}{2}$	.9104167	19 2 $\frac{1}{2}$	.9604167
16 2 $\frac{3}{4}$	.8114583	17 2 $\frac{3}{4}$	.8614583	18 2 $\frac{3}{4}$	.9114583	19 2 $\frac{3}{4}$	.9614583
16 3	.8125000	17 3	.8625000	18 3	.9125000	19 3	.9625000
16 3 $\frac{1}{4}$	.8135417	17 3 $\frac{1}{4}$	.8635417	18 3 $\frac{1}{4}$	.9135417	19 3 $\frac{1}{4}$	.9635417
16 3 $\frac{1}{2}$	.8145833	17 3 $\frac{1}{2}$	.8645833	18 3 $\frac{1}{2}$	.9145833	19 3 $\frac{1}{2}$	.9645833
16 3 $\frac{3}{4}$	.8156250	17 3 $\frac{3}{4}$	.8656250	18 3 $\frac{3}{4}$	.9156250	19 3 $\frac{3}{4}$	.9656250
16 4	.8166667	17 4	.8666667	18 4	.9166667	19 4	.9666667
16 4 $\frac{1}{4}$	.8177083	17 4 $\frac{1}{4}$	.8677083	18 4 $\frac{1}{4}$	.9177083	19 4 $\frac{1}{4}$	.9677083
16 4 $\frac{1}{2}$	.8187500	17 4 $\frac{1}{2}$	.8687500	18 4 $\frac{1}{2}$	.9187500	19 4 $\frac{1}{2}$	.9687500
16 4 $\frac{3}{4}$	.8197917	17 4 $\frac{3}{4}$	.8697917	18 4 $\frac{3}{4}$	.9197917	19 4 $\frac{3}{4}$	.9697917
16 5	.8208333	17 5	.8708333	18 5	.9208333	19 5	.9708333
16 5 $\frac{1}{4}$	.8218750	17 5 $\frac{1}{4}$	.8718750	18 5 $\frac{1}{4}$	.9218750	19 5 $\frac{1}{4}$	.9718750
16 5 $\frac{1}{2}$	.8229167	17 5 $\frac{1}{2}$	.8729167	18 5 $\frac{1}{2}$	.9229167	19 5 $\frac{1}{2}$	.9729167
16 5 $\frac{3}{4}$	.8239583	17 5 $\frac{3}{4}$	.8739583	18 5 $\frac{3}{4}$	.9239583	19 5 $\frac{3}{4}$	.9739583
16 6	.8250000	17 6	.8750000	18 6	.9250000	19 6	.9750000
16 6 $\frac{1}{4}$	.8260417	17 6 $\frac{1}{4}$	.8760417	18 6 $\frac{1}{4}$	.9260417	19 6 $\frac{1}{4}$	.9760417
16 6 $\frac{1}{2}$	.8270833	17 6 $\frac{1}{2}$	.8770833	18 6 $\frac{1}{2}$	.9270833	19 6 $\frac{1}{2}$	.9770833
16 6 $\frac{3}{4}$	.8281250	17 6 $\frac{3}{4}$	.8781250	18 6 $\frac{3}{4}$	.9281250	19 6 $\frac{3}{4}$	.9781250
16 7	.8291667	17 7	.8791667	18 7	.9291667	19 7	.9791667
16 7 $\frac{1}{4}$	.8302083	17 7 $\frac{1}{4}$	.8802083	18 7 $\frac{1}{4}$	.9302083	19 7 $\frac{1}{4}$	.9802083
16 7 $\frac{1}{2}$	.8312500	17 7 $\frac{1}{2}$	.8812500	18 7 $\frac{1}{2}$	.9312500	19 7 $\frac{1}{2}$	.9812500
16 7 $\frac{3}{4}$	.8322917	17 7 $\frac{3}{4}$	.8822917	18 7 $\frac{3}{4}$	.9322917	19 7 $\frac{3}{4}$	.9822917
16 8	.8333333	17 8	.8833333	18 8	.9333333	19 8	.9833333
16 8 $\frac{1}{4}$	.8343750	17 8 $\frac{1}{4}$	.8843750	18 8 $\frac{1}{4}$	.9343750	19 8 $\frac{1}{4}$	.9843750
16 8 $\frac{1}{2}$	.8354167	17 8 $\frac{1}{2}$	.8854167	18 8 $\frac{1}{2}$	.9354167	19 8 $\frac{1}{2}$	.9854167
16 8 $\frac{3}{4}$	.8364583	17 8 $\frac{3}{4}$	.8864583	18 8 $\frac{3}{4}$	.9364583	19 8 $\frac{3}{4}$	.9864583
16 9	.8375000	17 9	.8875000	18 9	.9375000	19 9	.9875000
16 9 $\frac{1}{4}$	.8385417	17 9 $\frac{1}{4}$	.8885417	18 9 $\frac{1}{4}$	.9385417	19 9 $\frac{1}{4}$	.9885417
16 9 $\frac{1}{2}$	.8395833	17 9 $\frac{1}{2}$	.8895833	18 9 $\frac{1}{2}$	.9395833	19 9 $\frac{1}{2}$	.9895833
16 9 $\frac{3}{4}$	.8406250	17 9 $\frac{3}{4}$	.8906250	18 9 $\frac{3}{4}$	.9406250	19 9 $\frac{3}{4}$	.9906250
16 10	.8416667	17 10	.8916667	18 10	.9416667	19 10	.9916667
16 10 $\frac{1}{4}$	.8427083	17 10 $\frac{1}{4}$	.8927083	18 10 $\frac{1}{4}$	.9427083	19 10 $\frac{1}{4}$	.9927083
16 10 $\frac{1}{2}$	.8437500	17 10 $\frac{1}{2}$	.8937500	18 10 $\frac{1}{2}$	.9437500	19 10 $\frac{1}{2}$	.9937500
16 10 $\frac{3}{4}$	.8447917	17 10 $\frac{3}{4}$	.8947917	18 10 $\frac{3}{4}$	.9447917	19 10 $\frac{3}{4}$	.9947917
16 11	.8458333	17 11	.8958333	18 11	.9458333	19 11	.9958333
16 11 $\frac{1}{4}$	.8468750	17 11 $\frac{1}{4}$	.8968750	18 11 $\frac{1}{4}$	.9468750	19 11 $\frac{1}{4}$	.9968750
16 11 $\frac{1}{2}$	.8479167	17 11 $\frac{1}{2}$	.8979167	18 11 $\frac{1}{2}$	.9479167	19 11 $\frac{1}{2}$	.9979167
16 11 $\frac{3}{4}$	.8489583	17 11 $\frac{3}{4}$	.8989583	18 11 $\frac{3}{4}$	.9489583	19 11 $\frac{3}{4}$	.9989583
17 0	.8500000	18 0	.9000000	19 0	.9500000	20 0	1.0000000

TABLE II.

THE DECIMAL PARTS OF A YEAR, CORRESPONDING TO ANY NUMBER OF
DAYS, ETC.

Days.	Decimal.	Days.	Decimal.	Days.	Decimal.	Days.	Decimal.
1	.00273973	51	.13972603	101	.27671233	151	.41369863
2	.00547945	52	.14246575	102	.27945205	152	.41643836
3	.00821918	53	.14520548	103	.28219178	153	.41917808
4	.01095890	54	.14794521	104	.28493151	154	.42191781
5	.01369863	55	.15068493	105	.28767123	155	.42465753
6	.01643836	56	.15342466	106	.29041096	156	.42739726
7	.01917808	57	.15616438	107	.29315068	157	.43013699
8	.02191781	58	.15890411	108	.29589041	158	.43287671
9	.02465753	59	.16164384	109	.29863014	159	.43561644
10	.02739726	60	.16438356	110	.30136986	160	.43835616
11	.03013699	61	.16712329	111	.30410959	161	.44109589
12	.03287671	62	.16986301	112	.30684932	162	.44383562
13	.03561644	63	.17260274	113	.30958904	163	.44657534
14	.03835616	64	.17534247	114	.31232877	164	.44931507
15	.04109589	65	.17808219	115	.31506849	165	.45205479
16	.04383562	66	.18082192	116	.31780822	166	.45479452
17	.04657534	67	.18356164	117	.32054795	167	.45753425
18	.04931507	68	.18630137	118	.32328767	168	.46027397
19	.05205479	69	.18904110	119	.32602740	169	.46301370
20	.05479452	70	.19178082	120	.32876712	170	.46575342
21	.05753425	71	.19452055	121	.33150685	171	.46849315
22	.06027397	72	.19726027	122	.33424658	172	.47123288
23	.06301370	73	.20000000	123	.33698630	173	.47397260
24	.06575342	74	.20273973	124	.33972603	174	.47671233
25	.06849315	75	.20547945	125	.34246575	175	.47945205
26	.07123288	76	.20821918	126	.34520548	176	.48219178
27	.07397260	77	.21095890	127	.34794521	177	.48493151
28	.07671233	78	.21369863	128	.35068493	178	.48767123
29	.07945205	79	.21643836	129	.35342466	179	.49041096
30	.08219178	80	.21917808	130	.35616438	180	.49315068
31	.08493151	81	.22191781	131	.35890411	181	.49589041
32	.08767123	82	.22465753	132	.36164384	182	.49863014
33	.09041096	83	.22739726	133	.36438356	183	.50136986
34	.09315068	84	.23013699	134	.36712329	184	.50410959
35	.09589041	85	.23287671	135	.36986301	185	.50684932
36	.09863014	86	.23561644	136	.37260274	186	.50958904
37	.10136986	87	.23835616	137	.37534247	187	.51232877
38	.10410959	88	.24109589	138	.37808219	188	.51506849
39	.10684932	89	.24383562	139	.38082192	189	.51780822
40	.10958904	90	.24657534	140	.38356164	190	.52054795
41	.11232877	91	.24931507	141	.38630137	191	.52328767
42	.11506849	92	.25205479	142	.38904110	192	.52602740
43	.11780822	93	.25479452	143	.39178082	193	.52876712
44	.12054795	94	.25753425	144	.39452055	194	.53150685
45	.12328767	95	.26027397	145	.39726027	195	.53424658
46	.12602740	96	.26301370	146	.40000000	196	.53698630
47	.12876712	97	.26575342	147	.40273973	197	.53972603
48	.13150685	98	.26849315	148	.40547945	198	.54246575
49	.13424658	99	.27123288	149	.40821918	199	.54520548
50	.13698630	100	.27397260	150	.41095890	200	.54794521

TABLE II.

THE DECIMAL PARTS OF A YEAR, CORRESPONDING TO ANY NUMBER OF
DAYS, ETC.

Days.	Decimal.	Days.	Decimal.	Days.	Decimal.	Days.	Decimal.
201	.55068493	251	.68767123	301	.82465753	351	.96164384
202	.55342466	252	.69041096	302	.82739726	352	.96438356
203	.55616438	253	.69315068	303	.83013699	353	.96712329
204	.55890411	254	.69589041	304	.83287671	354	.96986301
205	.56164384	255	.69863014	305	.83561644	355	.97260274
206	.56438356	256	.70136986	306	.83835616	356	.97534247
207	.56712329	257	.70410959	307	.84109589	357	.97808219
208	.56986301	258	.70684932	308	.84383562	358	.98082192
209	.57260274	259	.70958904	309	.84657534	359	.98356164
210	.57534247	260	.71232877	310	.84931507	360	.98630137
211	.57808219	261	.71506849	311	.85205479	361	.98904110
212	.58082192	262	.71780822	312	.85479452	362	.99178082
213	.58356164	263	.72054795	313	.85753425	363	.99452055
214	.58630137	264	.72328767	314	.86027397	364	.99726027
215	.58904110	265	.72602740	315	.86301370	365	1.00000000
216	.59178082	266	.72876712	316	.86575342	Year.	
217	.59452055	267	.73150685	317	.86849315	$\frac{1}{12}$	.062500
218	.59726027	268	.73424658	318	.87123288	$\frac{1}{12}$	.083333
219	.60000000	269	.73698630	319	.87397260	$\frac{1}{12}$	.100000
220	.60273973	270	.73972603	320	.87671233	$\frac{1}{12}$	
221	.60547945	271	.74246575	321	.87945205	$\frac{1}{12}$	.125000
222	.60821918	272	.74520548	322	.88219178	$\frac{1}{12}$	.166666
223	.61095890	273	.74794521	323	.88493151	$\frac{1}{12}$	.187500
224	.61369863	274	.75068493	324	.88767123	$\frac{1}{12}$	.200000
225	.61643836	275	.75342466	325	.89041096	$\frac{1}{12}$	.250000
226	.61917808	276	.75616438	326	.89315068	$\frac{1}{12}$	.300000
227	.62191781	277	.75890411	327	.89589041	$\frac{1}{12}$	.312500
228	.62465753	278	.76164384	328	.89863014	$\frac{1}{12}$	.333333
229	.62739726	279	.76438356	329	.90136986	$\frac{1}{12}$	.375000
230	.63013699	280	.76712329	330	.90410959	$\frac{1}{12}$	.400000
231	.63287671	281	.76986301	331	.90684932	$\frac{1}{12}$	.416666
232	.63561644	282	.77260274	332	.90958904	$\frac{1}{12}$	.437500
233	.63835616	283	.77534247	333	.91232877	$\frac{1}{12}$	.500000
234	.64109589	284	.77808219	334	.91506849	$\frac{1}{12}$	.562500
235	.64383562	285	.78082192	335	.91780822	$\frac{1}{12}$	.583333
236	.64657534	286	.78356164	336	.92054795	$\frac{1}{12}$	.600000
237	.64931507	287	.78630137	337	.92328767	$\frac{1}{12}$	.625000
238	.65205479	288	.78904110	338	.92602740	$\frac{1}{12}$	.666666
239	.65479452	289	.79178082	339	.92876712	$\frac{1}{12}$	.687500
240	.65753425	290	.79452055	340	.93150685	$\frac{1}{12}$	.700000
241	.66027397	291	.79726027	341	.93424658	$\frac{1}{12}$	.750000
242	.66301370	292	.80000000	342	.93698630	$\frac{1}{12}$	.800000
243	.66575342	293	.80273973	343	.93972603	$\frac{1}{12}$	.812500
244	.66849315	294	.80547945	344	.94246575	$\frac{1}{12}$	.833333
245	.67123288	295	.80821918	345	.94520548	$\frac{1}{12}$	.875000
246	.67397260	296	.81095890	346	.94794521	$\frac{1}{12}$	.900000
247	.67671233	297	.81369863	347	.95068493	$\frac{1}{12}$	.916666
248	.67945205	298	.81643836	348	.95342466	$\frac{1}{12}$	.937500
249	.68219178	299	.81917808	349	.95616438		
250	.68493151	300	.82191781	350	.95890411		

TABLE III.

PRESENT VALUE OF £1, PAYABLE ANY NUMBER OF YEARS HENCE, NOT
EXCEEDING 105 YEARS.

Years.	3 per cent.	3½ per cent.	4 per cent.	5 per cent.	6 per cent.
1	.97087379	.96618357	.96153846	.95238095	.94339623
2	.94259591	.93351070	.92455621	.90702948	.88999644
3	.91514166	.90194270	.88899636	.86383760	.83961928
4	.88848705	.87144223	.85480419	.82270247	.79209366
5	.86260878	.84197317	.82192711	.78352617	.74725817
6	.83748426	.81350064	.79031453	.74621540	.70496054
7	.81309151	.78599096	.75991781	.71068133	.66505711
8	.78940923	.75941155	.73069020	.67683936	.62741237
9	.76641673	.73373097	.70258674	.64460892	.59189846
10	.74409391	.70891881	.67556417	.61391325	.55839478
11	.72242127	.68494571	.64958093	.58467929	.52678752
12	.70137988	.66178330	.62459705	.55683742	.49696936
13	.68095134	.63940415	.60057409	.53032135	.46883902
14	.66111781	.61778179	.57747508	.50506795	.44230096
15	.64186195	.59689062	.55526450	.48101710	.41726506
16	.62316694	.57670591	.53390818	.45811152	.39364628
17	.60501645	.55720378	.51337325	.43629669	.37136442
18	.58739461	.53836114	.49362812	.41552065	.35034379
19	.57028603	.52015569	.47464242	.39573396	.33051301
20	.55367576	.50256588	.45638695	.37688948	.31180473
21	.53754928	.48557090	.43883360	.35894236	.29415540
22	.52189250	.46915063	.42195539	.34184987	.27750510
23	.50669175	.45328563	.40572633	.32557130	.26179726
24	.49193374	.43795713	.39012147	.31006791	.24697855
25	.47760557	.42314699	.37511680	.29530277	.23299863
26	.46369473	.40883767	.36068923	.28124073	.21981003
27	.45018906	.39501224	.34681657	.26784832	.20736795
28	.43707675	.38165434	.33347747	.25509364	.19563014
29	.42434636	.36874816	.32065141	.24294632	.18455674
30	.41198676	.35627841	.30831867	.23137745	.17411013
31	.39998715	.34423035	.29646026	.22035947	.16425484
32	.38833703	.33258971	.28505794	.20986617	.15495740
33	.37702625	.32134271	.27409417	.19987254	.14618622
34	.36604490	.31047605	.26355209	.19035480	.13791153
35	.35538340	.29997686	.25341547	.18129028	.13010522
36	.34503243	.28983272	.24366872	.17265741	.12274077
37	.33498294	.28003161	.23429685	.16443563	.11579318
38	.32522615	.27056194	.22528543	.15660536	.10923885
39	.31575355	.26141251	.21662061	.14914797	.10305552
40	.30655684	.25257247	.20828904	.14204568	.09722219
41	.29762800	.24403137	.20027793	.13528160	.09171904
42	.28895922	.23577910	.19257493	.12883962	.08652740
43	.28054294	.22780590	.18516820	.12270440	.08162962
44	.27237178	.22010232	.17804635	.11686133	.07700908
45	.26443862	.21265924	.17119841	.11129651	.07265007
46	.25673653	.20546787	.16461386	.10599667	.06853781
47	.24925876	.19851968	.15828256	.10094921	.06465831
48	.24199880	.19180645	.15219476	.09614211	.06099840
49	.23495029	.18532024	.14634112	.09156391	.05754566
50	.22810708	.17905338	.14071261	.08720373	.05428836
51	.22146318	.17299843	.13530059	.08305117	.05121544
52	.21501280	.16714824	.13009672	.07909635	.04831645
53	.20875029	.16149589	.12509300	.07532986	.04558156

TABLE III.

PRESENT VALUE OF £1, PAYABLE ANY NUMBER OF YEARS HENCE, NOT
EXCEEDING 105 YEARS.

Years.	3 per cent.	3½ per cent.	4 per cent.	5 per cent.	6 per cent.
54	.20267018	.15603467	.12028173	.07174272	.04300147
55	.19676717	.15075814	.11565551	.06832640	.04056742
56	.19103609	.14566004	.11120722	.06507276	.03827115
57	.18547193	.14073433	.10693002	.06197406	.03610486
58	.18006983	.13597520	.10281733	.05902291	.03406119
59	.17482508	.13137701	.09886282	.05621230	.03213320
60	.16973309	.12693431	.09506040	.05353552	.03031434
61	.16478941	.12264184	.09140423	.05098621	.02859843
62	.15998972	.11849453	.08788868	.04855830	.02697965
63	.15532982	.11448747	.08450835	.04624600	.02545250
64	.15080565	.11061591	.08125803	.04404381	.02401180
65	.14641325	.10687528	.07813272	.04194648	.02265264
66	.14214879	.10326114	.07512761	.03994903	.02137041
67	.13800853	.09976922	.07223809	.03804670	.02016077
68	.13398887	.09639538	.06945970	.03623495	.01901959
69	.13008628	.09313563	.06678818	.03450948	.01794301
70	.12629736	.08998612	.06421940	.03286617	.01692737
71	.12261879	.08694311	.06174942	.03130111	.01596922
72	.11904737	.08400300	.05937444	.02981058	.01506530
73	.11557997	.08116232	.05709081	.02839103	.01421254
74	.11221357	.07841770	.05489501	.02703908	.01340806
75	.10894521	.07576590	.05278366	.02575150	.01264911
76	.10577205	.07320376	.05075352	.02452524	.01193313
77	.10269131	.07072827	.04880146	.02335737	.01125767
78	.09970030	.06833650	.04692449	.02224511	.01062044
79	.09679641	.06602560	.04511970	.02118582	.01001928
80	.09397710	.06379285	.04338432	.02017697	.00945215
81	.09123990	.06163561	.04171570	.01921617	.00891713
82	.08858243	.05955131	.04011125	.01830111	.00841238
83	.08600236	.05753750	.03856851	.01742963	.00793621
84	.08349743	.05559179	.03708510	.01659965	.00748699
85	.08106547	.05371187	.03565875	.01580919	.00706320
86	.07870434	.05189553	.03428726	.01505637	.00666339
87	.07641198	.05014061	.03296852	.01433940	.00628622
88	.07418639	.04844503	.03170050	.01365657	.00593040
89	.07202562	.04680679	.03048125	.01300626	.00559471
90	.06992778	.04522395	.02930889	.01238691	.00527803
91	.06789105	.04369464	.02818163	.01179706	.00497928
92	.06591364	.04221705	.02709772	.01123529	.00469743
93	.06399383	.04078942	.02605550	.01070028	.00443154
94	.06212993	.03941006	.02505337	.01019074	.00418070
95	.06032032	.03807736	.02408977	.00970547	.00394405
96	.05856342	.03678972	.02316324	.00924330	.00372080
97	.05685769	.03554562	.02227235	.00880315	.00351019
98	.05520164	.03434359	.02141572	.00838395	.00331150
99	.05359382	.03318222	.02059204	.00798471	.00312406
100	.05203284	.03206011	.01980004	.00760449	.00294722
101	.05051732	.03097595	.01903850	.00724237	.00278040
102	.04904594	.02992846	.01830625	.00689750	.00262302
103	.04761742	.02891638	.01760216	.00656904	.00247455
104	.04623050	.02793854	.01692515	.00625623	.00233448
105	.04488398	.02699376	.01627419	.00595832	.00220234

TABLE IV.

AMOUNT OF £1 AT THE END OF ANY NUMBER OF YEARS NOT
EXCEEDING 105.

Years.	3 per cent.	3½ per cent.	4 per cent.	5 per cent.	6 per cent.
1	1.03000000	1.03500000	1.04000000	1.05000000	1.06000000
2	1.06090000	1.07122500	1.08160000	1.10250000	1.12360000
3	1.09272700	1.10871787	1.12486400	1.15762500	1.19101600
4	1.12550881	1.14752300	1.16985886	1.21550625	1.26247696
5	1.15927407	1.18768631	1.21665290	1.27628156	1.33822558
6	1.19405230	1.22925533	1.26531902	1.34009564	1.41851911
7	1.22987387	1.27227926	1.31593178	1.40710042	1.50363026
8	1.26677008	1.31680904	1.36856905	1.47745544	1.59384807
9	1.30477318	1.36289735	1.42331181	1.55132822	1.68947896
10	1.34391638	1.41059876	1.48024428	1.62889463	1.79084770
11	1.38423387	1.45996972	1.53945406	1.71033936	1.89829856
12	1.42576089	1.51106866	1.60103222	1.79585633	2.01219647
13	1.46853371	1.56395606	1.66507351	1.88564914	2.13292826
14	1.51258972	1.61869452	1.73167645	1.97993160	2.26090396
15	1.55796742	1.67534883	1.80094351	2.07892818	2.39655819
16	1.60470644	1.73398604	1.87298125	2.18287459	2.54035168
17	1.65284763	1.79467555	1.94790050	2.29201832	2.69277279
18	1.70243306	1.85748920	2.02581652	2.40661923	2.85433915
19	1.75350605	1.92250132	2.10684918	2.52695020	3.02559950
20	1.80611123	1.98978886	2.19112314	2.65329771	3.20713547
21	1.86029457	2.05943147	2.27876807	2.78596259	3.39956360
22	1.91610341	2.13151158	2.36991879	2.92526072	3.60353742
23	1.97358651	2.20611448	2.46471554	3.07152376	3.81974966
24	2.03279411	2.28332849	2.56330416	3.22509994	4.04893464
25	2.09377793	2.36324498	2.66583633	3.38635494	4.29187072
26	2.15659127	2.44595856	2.77246978	3.55567269	4.54938296
27	2.22128901	2.53156711	2.88336858	3.73345632	4.82234594
28	2.28792768	2.62017196	2.99870332	3.92012914	5.11168670
29	2.35656551	2.71187798	3.11865145	4.11613560	5.41838790
30	2.42726247	2.80679370	3.24339751	4.32194238	5.74349117
31	2.50008035	2.90503148	3.37313341	4.53803949	6.08810064
32	2.57508276	3.00670759	3.50805875	4.76494147	6.45338668
33	2.65233524	3.11194235	3.64838110	5.00318854	6.84058988
34	2.73190530	3.22086033	3.79431634	5.25334797	7.25102528
35	2.81386245	3.33359045	3.94608899	5.51601537	7.68608679
36	2.89827833	3.45026611	4.10393255	5.79181614	8.14725200
37	2.98522668	3.57102542	4.26808986	6.08140694	8.63608712
38	3.07478348	3.69601131	4.43881345	6.38547729	9.15425235
39	3.16702698	3.82537171	4.61636599	6.70475115	9.70350749
40	3.26203779	3.95925972	4.80102063	7.03998871	10.28571794
41	3.35989893	4.09783381	4.99306145	7.39198815	10.90286101
42	3.46069589	4.24125799	5.19278391	7.76158756	11.55703267
43	3.56451677	4.38970202	5.40049527	8.14966693	12.25045463
44	3.67145227	4.54334160	5.61651508	8.55715028	12.98548191
45	3.78159584	4.70235855	5.84117568	8.98500779	13.76461083
46	3.89504372	4.86694110	6.07482271	9.43425818	14.59048748
47	4.01189503	5.03728404	6.31781562	9.90597109	15.46591673
48	4.13225188	5.21358898	6.57052824	10.40126965	16.39387173
49	4.25621944	5.39606459	6.83334937	10.92133313	17.37750403
50	4.38390602	5.58492686	7.10668335	11.46739979	18.42015427
51	4.51542320	5.78039930	7.39095068	12.04076978	19.52536353
52	4.65088590	5.98271327	7.68658871	12.64280826	20.69688534
53	4.79041247	6.19210823	7.99405226	13.27494868	21.93869846

TABLE IV.

AMOUNT OF £1 AT THE END OF ANY NUMBER OF YEARS NOT
EXCEEDING 105.

Years.	3 per cent.	3½ per cent.	4 per cent.	5 per cent.	6 per cent.
54	4.93412485	6.40883202	8.31381435	13.93869611	23.25502037
55	5.08214859	6.63314114	8.64636692	14.63563092	24.65032159
56	5.23461305	6.86530108	8.99222160	15.36741246	26.12934089
57	5.39165144	7.10558662	9.35191046	16.13578309	27.69710134
58	5.55340098	7.35428215	9.72598688	16.94257224	29.35892742
59	5.72000301	7.61168203	10.11502635	17.78970085	31.12046307
60	5.89160310	7.87809090	10.51962741	18.67918589	32.98769085
61	6.06835120	8.15382408	10.94041250	19.61314519	34.96695230
62	6.25040173	8.43920792	11.37802900	20.59380245	37.06496944
63	6.43791378	8.73458020	11.83315016	21.62349257	39.28886761
64	6.63105120	9.04029051	12.30647617	22.70466720	41.64619966
65	6.82998273	9.35670068	12.79873522	23.83990056	44.14497164
66	7.03488222	9.68418520	13.31068463	25.03189559	46.79366994
67	7.24592868	10.02313168	13.84311201	26.28349037	49.60129014
68	7.46330654	10.37394129	14.39683649	27.59766488	52.57736755
69	7.68720574	10.73702924	14.97270995	28.97754813	55.73200960
70	7.91782191	11.11282526	15.57161835	30.42642554	59.07593018
71	8.15535657	11.50177414	16.19448308	31.94774681	62.62048599
72	8.40001727	11.90433624	16.84226241	33.54513415	66.37771515
73	8.65201778	12.32098801	17.51595290	35.22239086	70.36037806
74	8.91157832	12.75222259	18.21659102	36.98351040	74.58200074
75	9.17892567	13.19855038	18.94525466	38.83268592	79.05692078
76	9.45429344	13.66049964	19.70306485	40.77432022	83.80033603
77	9.73792224	14.13861713	20.49118744	42.81303623	88.82835619
78	10.03005991	14.63346873	21.31083494	44.95368804	94.15805756
79	10.33096170	15.14564013	22.16326833	47.20137244	99.80754102
80	10.64089056	15.67573754	23.04979907	49.56144107	105.79599348
81	10.96011727	16.22438835	23.97179103	52.03951312	112.14375309
82	11.28892079	16.79224194	24.93066267	54.64148878	118.87237827
83	11.62758841	17.37997041	25.92788918	57.37356322	126.00472097
84	11.97641607	17.98826938	26.96500475	60.24224138	133.56500423
85	12.33570855	18.61785880	28.04360494	63.25435344	141.57890448
86	12.70577981	19.26948386	29.16534913	66.41707112	150.07363875
87	13.08695320	19.94391580	30.33196310	69.73792467	159.07805708
88	13.47956180	20.64195285	31.54524162	73.22482091	168.62274050
89	13.88394865	21.36442120	32.80705129	76.88606195	178.74010493
90	14.30046711	22.11217594	34.11933334	80.73036505	189.46451123
91	14.72948112	22.88610210	35.48410667	84.76688330	200.83238190
92	15.17136556	23.68711567	36.90347094	89.00522747	212.88232481
93	15.62650652	24.51616472	38.37960978	93.45548884	225.65526430
94	16.09530172	25.37423049	39.91479417	98.12826328	239.19458016
95	16.57816077	26.26232856	41.51138594	103.03467645	253.54625497
96	17.07550559	27.18151005	43.17184137	108.18641027	268.75903027
97	17.58777076	28.13286291	44.89871503	113.59573078	284.88457208
98	18.11540388	29.11751311	46.69466363	119.27551732	301.97764641
99	18.65886600	30.13662607	48.56245017	125.23929319	320.09630519
100	19.21863198	31.19140798	50.50494818	131.50125785	339.30208351
101	19.79519094	32.28310726	52.52514611	138.07632074	359.66020852
102	20.38904667	33.41301601	54.62615195	144.98013678	381.23982103
103	21.00071807	34.58247157	56.81119803	152.22914361	404.11421029
104	21.63073961	35.79285808	59.08364595	159.84060080	428.36106291
105	22.27966180	37.04560811	61.44699179	167.83263084	454.06272668

TABLE V.

PRESENT VALUE OF \$1 PER ANNUM FOR ANY NUMBER OF YEARS
NOT EXCEEDING 105.

Years.	8 per cent.	8½ per cent.	4 per cent.	5 per cent.	6 per cent.
1	.97087379	.96618357	.96153846	.95238095	.94339623
2	1.91346969	1.89969427	1.88609467	1.85941043	1.83339267
3	2.82861135	2.80163698	2.77509103	2.72324803	2.67301195
4	3.71709840	3.67307921	3.62989522	3.54595050	3.46510561
5	4.57970719	4.51505237	4.45182233	4.32947667	4.21236378
6	5.41719144	5.32855302	5.24213686	5.07569207	4.91732432
7	6.23028295	6.11454398	6.00205467	5.78637340	5.58238144
8	7.01969219	6.87395553	6.73274488	6.46321276	6.20979381
9	7.78610892	7.60768651	7.43533161	7.10782167	6.80169227
10	8.53020284	8.31660532	8.11089578	7.72173493	7.36008705
11	9.25262410	9.00155103	8.76047671	8.30641422	7.88687457
12	9.95400398	9.66333433	9.38507376	8.86325164	8.38384393
13	10.63495532	10.30273848	9.98564785	9.39357299	8.85268295
14	11.29607312	10.92052027	10.56312293	9.89864094	9.29498392
15	11.93793507	11.51741089	11.11838744	10.37965804	9.71224898
16	12.56110201	12.09411681	11.65229561	10.83776956	10.10589526
17	13.16611845	12.65132058	12.16566886	11.27406625	10.47725968
18	13.75351306	13.18968172	12.65929698	11.68958690	10.82760347
19	14.32379909	13.70983741	13.13393940	12.08532086	11.15811648
20	14.87747484	14.21240330	13.59032635	12.46221034	11.46992121
21	15.41502412	14.69797420	14.02915995	12.82115271	11.76407661
22	15.93691662	15.16712483	14.45111534	13.16300258	12.04158171
23	16.44360837	15.62041047	14.85684167	13.48857388	12.30337897
24	16.93554210	16.05836760	15.24696314	13.79864179	12.55035752
25	17.41314766	16.48151459	15.62207995	14.09394457	12.78335615
26	17.87684239	16.89035226	15.98276918	14.37518530	13.00316618
27	18.32703145	17.28536450	16.32958575	14.64303362	13.21053413
28	18.76410820	17.66701884	16.66306322	14.89812726	13.40616428
29	19.18845456	18.03576700	16.98371464	15.14107358	13.59072101
30	19.60044132	18.39204541	17.29203330	15.37245103	13.76483115
31	20.00042847	18.73627576	17.58849356	15.59281050	13.92908599
32	20.38876550	19.06886547	17.87355150	15.80267667	14.08404338
33	20.76579175	19.39020818	18.14764567	16.00254921	14.23022961
34	21.13183665	19.70068423	18.41119776	16.19290401	14.36814114
35	21.48722004	20.00066109	18.66461323	16.37419429	14.49824636
36	21.83225247	20.29049381	18.90828196	16.54685171	14.62098713
37	22.16723541	20.57052542	19.14257880	16.71128734	14.73678031
38	22.49246156	20.84108736	19.36786424	16.86789271	14.84601916
39	22.80821510	21.10249987	19.58448484	17.01704067	14.94907468
40	23.11477195	21.35507234	19.79277389	17.15908636	15.04629687
41	23.41239995	21.59910371	19.99305181	17.29436796	15.13801591
42	23.70135917	21.83488281	20.18562674	17.42320758	15.22454331
43	23.98190211	22.06268870	20.37079494	17.54591198	15.30617294
44	24.25427389	22.28279102	20.54884129	17.66277331	15.38318202
45	24.51871251	22.49545026	20.72003970	17.77406982	15.45583209
46	24.77544904	22.70091812	20.88465356	17.88006650	15.52436990
47	25.02470780	22.89943780	21.04293612	17.98101571	15.58902821
48	25.26670660	23.09124425	21.19513088	18.07715782	15.65002661
49	25.50165689	23.27656449	21.34147200	18.16872173	15.70757227
50	25.72976397	23.45561787	21.48218462	18.25592546	15.76186063
51	25.95122716	23.62861630	21.61748521	18.33897663	15.81307607
52	26.16623996	23.79576454	21.74758193	18.41807298	15.86139252
53	26.37499025	23.95726043	21.87267493	18.49340284	15.90697407

TABLE V.

PRESENT VALUE OF £1 PER ANNUM FOR ANY NUMBER OF YEARS
NOT EXCEEDING 105.

Years.	3 per cent.	3½ per cent.	4 per cent.	5 per cent.	6 per cent.
54	26.57766043	24.11329510	21.99295667	18.56514556	15.94997554
55	26.77442761	24.26405323	22.10861218	18.63347196	15.99054296
56	26.96546370	24.40971327	22.21981940	18.69854473	16.02881412
57	27.15093563	24.55044760	22.32674943	18.76051879	16.06491898
58	27.33100546	24.68642281	22.42956676	18.81954170	16.09898017
59	27.50583055	24.81779981	22.52842957	18.87575400	16.13111336
60	27.67556364	24.94473412	22.62348997	18.92928953	16.16142770
61	27.84035304	25.06737596	22.71489421	18.98027574	16.19002613
62	28.00034276	25.18587049	22.80278289	19.02883404	16.21700579
63	28.15567258	25.30035796	22.88729124	19.07508003	16.24245829
64	28.30647823	25.41097388	22.96854927	19.11912384	16.26647008
65	28.45289149	25.51784916	23.04668199	19.16107033	16.28912272
66	28.59504028	25.62111030	23.12180959	19.20101936	16.31049313
67	28.73304881	25.72087951	23.19404768	19.23906606	16.33065390
68	28.86703768	25.81727489	23.26350739	19.27530101	16.34967349
69	28.99712396	25.91041053	23.33029556	19.30981048	16.36761650
70	29.12342132	26.00039664	23.39451497	19.34267665	16.38454387
71	29.24604012	26.08733975	23.45626439	19.37397776	16.40051308
72	29.36508749	26.17134276	23.51563884	19.40378834	16.41557838
73	29.48066747	26.25250508	23.57272965	19.43217938	16.42979092
74	29.59288104	26.33092278	23.62762466	19.45921845	16.44319898
75	29.70182625	26.40668868	23.68040833	19.48496995	16.45584810
76	29.80759830	26.47989244	23.73116185	19.50949519	16.46778122
77	29.91028961	26.55062072	23.77996332	19.53285257	16.47903889
78	30.00989891	26.61895722	23.82688781	19.55509768	16.48965933
79	30.10678632	26.68498282	23.87200751	19.57628351	16.49967861
80	30.20076342	26.74877567	23.91539183	19.59646048	16.50913077
81	30.29200332	26.81041128	23.95710753	19.61567665	16.51804789
82	30.38058574	26.86996259	23.99721878	19.63397776	16.52646028
83	30.46658810	26.92750008	24.03578729	19.65140739	16.53439649
84	30.55008553	26.98309187	24.07287239	19.66800704	16.54188348
85	30.63115100	27.03680374	24.10853114	19.68381623	16.54894668
86	30.70985534	27.08869926	24.14281841	19.69887260	16.55561007
87	30.78626732	27.13883987	24.17578693	19.71321200	16.56189630
88	30.86045371	27.18728490	24.20748743	19.72686857	16.56782669
89	30.93247933	27.23409169	24.23796868	19.73987483	16.57342141
90	31.00240711	27.27931564	24.26727758	19.75226174	16.57869944
91	31.07029817	27.32301028	24.29545921	19.76405880	16.58367872
92	31.13621181	27.36522732	24.32255693	19.77529410	16.58837615
93	31.20020564	27.40601674	24.34861243	19.78599438	16.59280769
94	31.26233557	27.44542680	24.37366580	19.79618512	16.59698839
95	31.32265590	27.48350415	24.39775558	19.80589059	16.60093244
96	31.38121932	27.52029387	24.42091882	19.81513390	16.60465325
97	31.43807700	27.55583949	24.44319118	19.82393705	16.60816344
98	31.49327864	27.59018307	24.46460690	19.83232100	16.61147494
99	31.54687247	27.62336529	24.48519894	19.84030571	16.61459900
100	31.59890531	27.65542540	24.50499898	19.84791020	16.61754623
101	31.64942263	27.68640135	24.52403748	19.85515257	16.62032663
102	31.69846857	27.71632981	24.54234373	19.86205007	16.62294965
103	31.74608599	27.74524619	24.55994589	19.86861911	16.62542420
104	31.79231649	27.77318473	24.57687105	19.87487534	16.62775868
105	31.83620047	27.80017849	24.59314524	19.88083366	16.62996102
Perp.	33.33333333	28.57142857	25.00000000	20.00000000	16.66666667

TABLE VI.

AMOUNT OF £1 PER ANNUM, AT THE END OF ANY NUMBER OF YEARS
NOT EXCEEDING 105.

Years.	3 per cent.	3½ per cent.	4 per cent.	5 per cent.	6 per cent.
1	1.00000000	1.00000000	1.00000000	1.00000000	1.00000000
2	2.03000000	2.03500000	2.04000000	2.05000000	2.06000000
3	3.09090000	3.10622500	3.12160000	3.15250000	3.18360000
4	4.18362700	4.21494287	4.24646400	4.31012500	4.37461600
5	5.30913581	5.36246587	5.41632256	5.52563125	5.63709296
6	6.46840988	6.55015218	6.63297546	6.80191281	6.97531854
7	7.66246218	7.77940751	7.89829448	8.14200845	8.39383765
8	8.89233605	9.05168677	9.21422626	9.54910887	9.89746791
9	10.15910613	10.36849581	10.58279531	11.02656431	11.49131598
10	11.46387931	11.73139316	12.00610712	12.57789253	13.18079494
11	12.80779569	13.14199192	13.48635140	14.20678716	14.97164264
12	14.19202956	14.60196164	15.02580546	15.91712652	16.86994120
13	15.61779045	16.11303030	16.62683768	17.71298285	18.88213767
14	17.08632416	17.67698636	18.29191119	19.59863199	21.01506593
15	18.59891388	19.29568088	20.02358764	21.57856359	23.27596989
16	20.15688130	20.97102971	21.82453115	23.65749177	25.67252808
17	21.76158774	22.70501575	23.69751240	25.84036636	28.21287976
18	23.41443537	24.49969130	25.64541289	28.13238468	30.90565255
19	25.11686843	26.35718050	27.67122941	30.53900391	33.75999170
20	26.87037448	28.27968182	29.77807859	33.06595411	36.78559120
21	28.67648571	30.26947068	31.96920173	35.71925182	39.99272667
22	30.53678029	32.32890215	34.24796980	38.50521441	43.39229027
23	32.45288369	34.46041373	36.61788859	41.43047513	46.99582769
24	34.42647021	36.66652821	39.08260414	44.50199888	50.81557735
25	36.45926431	38.94985670	41.64590830	47.72709883	54.86451199
26	38.55304224	41.31310168	44.31174463	51.11345377	59.15638271
27	40.70963351	43.75906024	47.08421441	54.66912646	63.70576567
28	42.93092252	46.29062735	49.96758299	58.40258278	68.52811161
29	45.21885020	48.91079931	52.96628631	62.32271192	73.63979831
30	47.57541571	51.62267729	56.08493776	66.43884751	79.05818621
31	50.00267818	54.42947099	59.32833527	70.76078989	84.80167738
32	52.50275853	57.33450247	62.70146868	75.29882937	90.88977802
33	55.07784129	60.34121006	66.20952743	80.06377084	97.34316470
34	57.73017653	63.45315241	69.85790853	85.06695938	104.18375459
35	60.46208182	66.67401274	73.65222487	90.32030735	111.43477986
36	63.27594428	70.00760319	77.59831386	95.83632272	119.12086665
37	66.17422260	73.45786930	81.70224641	101.62813884	127.26811865
38	69.15944928	77.02889472	85.97033627	107.70954580	135.90420577
39	72.23423276	80.72490603	90.40914972	114.09502309	145.05845812
40	75.40125974	84.55027774	95.02551571	120.79977424	154.76196561
41	78.66329754	88.50953746	99.82653634	127.83976295	165.04768355
42	82.02319646	92.60737127	104.81959779	135.23175110	175.95054456
43	85.48389235	96.84862927	110.01238170	142.99333865	187.50757723
44	89.04840912	101.23833129	115.41287697	151.14300560	199.75803187
45	92.71986140	105.78167289	121.02939205	159.70015587	212.74351378
46	96.50145724	110.48403144	126.87056773	168.68516366	226.50812461
47	100.39650096	115.35097254	132.94539044	178.11942184	241.09861208
48	104.40839599	120.38825658	139.26320606	188.02539293	256.56452881
49	108.54064786	125.60184556	145.83373430	198.42666258	272.95840054
50	112.79686730	130.99791015	152.66708367	209.34799571	290.33590457
51	117.18077332	136.58283701	159.77376702	220.81539550	308.75605885
52	121.69619652	142.36323630	167.16471770	232.85616528	328.28142238
53	126.34708241	148.34594957	174.85130641	245.49897354	348.97830772

TABLE VI.

AMOUNT OF £1 PER ANNUM, AT THE END OF ANY NUMBER OF YEARS,
NOT EXCEEDING 105.

Years.	3 per cent.	3½ per cent.	4 per cent.	5 per cent.	6 per cent.
54	131.13749490	154.53805780	182.84535867	258.77392224	370.91700620
55	136.07161975	160.94688982	191.15917302	272.71261835	394.17202657
56	141.15376834	167.58003096	199.80553994	287.34824927	418.82234816
57	146.38838139	174.44533204	208.79776154	302.71566 73	444.95168905
58	151.78003283	181.55091866	218.14967200	318.85144482	472.64879039
59	157.33343381	188.90520081	227.87565888	335.79401706	502.00771782
60	163.05343682	196.51688284	237.99068523	353.5837179	533.12818089
61	168.94503992	204.39497374	248.51031264	372.26290380	566.1 587174
62	175.01339112	212.54879782	259.45072514	391.87604899	601.08282404
63	181.26379285	220.98800574	270.82875414	412.46985144	638.14779349
64	187.70170663	229.72258594	282.66 90430	434.09334401	677.43666 10
65	194.33275783	238 76287645	294.96838047	456.79801121	719.08286076
66	201.16274056	248.119577 3	307.76711569	480.63791177	763.22783241
67	208.19762278	257.80376233	321.07780032	505.66980736	810.02150235
68	215.44355146	267.82689401	334.92091233	531.95329773	859.62279249
69	222.90685800	278.20083530	349.31774882	559.55096261	912.20016004
70	230.59406374	288.93786454	364.29045877	588.52851074	967.93216964
71	238.51188565	300.05068980	379.862077 2	618.95493628	1027.00809982
72	246.66724222	311.55246394	396.05656020	650.90268309	1089.62858581
73	255.06725949	323.45680018	412.89882261	684.44781724	1 56.00630096
74	263.71927727	335.777788 9	430.41477551	719.67020810	1226.36667902
75	272.63085559	348.53001078	448.63136653	756.65371850	1300.94867976
76	281.80978126	361.72856116	467.57662119	795.48640442	1380.00560055
77	291.26407470	375.38906080	487.27968604	836.26072464	1463.80593658
78	301.00199694	389.52767793	507.77087348	879.07376087	1552.63429277
79	311.03205685	404.16114666	529.08170842	924.02744891	1646.79235034
80	321.36301855	419.30678679	551.24497675	971.22882135	1746.59989 36
81	332.00390911	434.98252433	574.29477582	1020.79026242	1852.39588484
82	342.96402638	451.20691268	598.26656685	1072.82977554	1964.53963793
83	354.25294717	467.99915462	623.19722952	1127.47126432	2083.4120162
84	365.88053558	485.37912503	649.12511870	1184.84482754	2209.41673718
85	377.85695165	503.36739441	676.09012345	1245.08706892	2342.98174141
86	390.19266020	521.98525321	704.13372839	1308.34142236	2484.56064589
87	402.89844001	541.25473707	733.29907752	1374.75849348	2634.63428465
88	415.98539321	561.19865287	763.63104062	1444.49641815	2793.71234 73
89	429.46495501	581.84060572	795.17628224	1517 72123906	2962.33508223
90	443.34890366	603.20502692	827.98333353	1594.60730101	314 .07518716
91	457.64937077	625.31720286	862.10266687	1675.33766606	3330.53969839
92	472.37885189	648.20330496	897.58677354	1760.10454936	353 .37208030
93	487.55021745	671.89042063	934.49024448	1849.10977683	3744.25440512
94	503.17672397	696.40658535	972.86985426	1942.56526567	3969.90966942
95	519.27202569	721.78081584	1012.78464843	2040.69352895	4209.10424959
96	535.85018646	748.04314440	1054.29603437	2143.72820540	4462.65050456
97	552.92569205	775.22465445	1097.46787574	2251.91461567	4731.40953484
98	570.51346281	803.35751736	1142.36659077	2365.51034645	5016.29410693
99	588.62886669	832.47503047	1189.06125440	2484.78586377	5318.27 75334
100	607.28773269	862.61165654	1237.62370457	2610.02515696	5638.36805854
101	626.50636467	893.80306452	1288. 2865275	2741.52641481	5977.67014205
102	646.30155561	926.08617178	1340.65379886	2879.60273555	6337.33035057
103	666.69060228	959.49918779	1395.27995081	3024.58287233	6718.57017160
104	687.69132035	994.08165936	1452.09 4884	3176.81201594	7122.68438189
105	709.32205996	1029.87451744	1510.17479479	3336.65261674	7551.04544480

TABLE VII.

THE ANNUITY WHICH £1 WILL PURCHASE, PAYABLE YEARLY FOR ANY
NUMBER OF YEARS NOT EXCEEDING 105.

Years.	3 per cent.	3½ per cent.	4 per cent.	5 per cent.	6 per cent.
1	1.03000000	1.03500000	1.04000000	1.05000000	1.06000000
2	.52261084	.52640049	.53019608	.53780488	.54543689
3	.35353036	.35693418	.36034854	.36720856	.37410981
4	.26902705	.27225114	.27549005	.28201183	.28859149
5	.21835457	.22148137	.22462711	.23097480	.23739640
6	.18459750	.18766821	.19076190	.19701747	.20336263
7	.16050635	.16354449	.16660961	.17281982	.17913502
8	.14245639	.14547665	.14852783	.15472181	.16103594
9	.12843386	.13144601	.13449299	.14069008	.14702224
10	.11723051	.12024137	.12329094	.12950458	.13586796
11	.10807745	.11109197	.11414904	.12038889	.12679294
12	.10046209	.10348395	.10655217	.11282541	.11927703
13	.09402954	.09706157	.10014373	.10645577	.11296011
14	.08852634	.09157073	.09466897	.10102397	.10758491
15	.08376658	.08682507	.08994110	.09634229	.10296276
16	.07961085	.08268483	.08582000	.09226991	.09895214
17	.07595253	.07904313	.08219852	.08869914	.09544480
18	.07270870	.07581684	.07899333	.08554622	.09235654
19	.06981388	.07294033	.07613862	.08274501	.08962086
20	.06721571	.07036108	.07358175	.08024259	.08718456
21	.06487178	.06803659	.07128011	.07799611	.08500455
22	.06274739	.06593207	.06919881	.07597051	.08304557
23	.06081390	.06401880	.06730906	.07413683	.08127848
24	.05904742	.06227283	.06558683	.07247090	.07967901
25	.05742787	.06067404	.06401196	.07095246	.07822672
26	.05593829	.05920540	.06256738	.06956432	.07690435
27	.05456421	.05785241	.06123854	.06829186	.07569717
28	.05329323	.05660265	.06001298	.06712253	.07459255
29	.05211467	.05544538	.05887993	.06604551	.07357961
30	.05101926	.05437133	.05783010	.06505144	.07264891
31	.04999893	.05337240	.05685535	.06413212	.07179222
32	.04904662	.05244150	.05594859	.06328042	.07100234
33	.04815612	.05157242	.05510357	.06249004	.07027293
34	.04732196	.05075966	.05431477	.06175549	.06959843
35	.04653929	.04999835	.05357732	.06107171	.06897386
36	.04580379	.04928416	.05288688	.06043446	.06839483
37	.04511162	.04861325	.05223956	.05983979	.06785743
38	.04445934	.04798214	.05163192	.05928423	.06735812
39	.04384385	.04738775	.05106083	.05876462	.06689380
40	.04326238	.04682728	.05052349	.05827816	.06646153
41	.04271241	.04629822	.05001738	.05782229	.06605886
42	.04219168	.04579828	.04954020	.05739471	.06568342
43	.04169811	.04532539	.04908989	.05699333	.06533312
44	.04122985	.04487768	.04866454	.05661625	.06500606
45	.04078518	.04445343	.04826246	.05626173	.06470050
46	.04036254	.04405108	.04788205	.05592820	.06441485
47	.03996051	.04366919	.04752189	.05561421	.06414768
48	.03957777	.04330646	.04718065	.05531843	.06389766
49	.03921314	.04296167	.04685712	.05503965	.06366356
50	.03886546	.04263371	.04655020	.05477674	.06344429
51	.03853382	.04232156	.04625885	.05452867	.06323880
52	.03821718	.04202428	.04598212	.05429449	.06304617
53	.03791471	.04174100	.04571915	.05407334	.06286551

TABLE VII.

THE ANNUITY WHICH £1 WILL PURCHASE, PAYABLE YEARLY FOR ANY
NUMBER OF YEARS NOT EXCEEDING 105.

Years.	8 per cent.	8½ per cent.	4 per cent.	5 per cent.	6 per cent.
54	.03762558	.04147090	.04546910	.05386438	.06269602
55	.03734907	.04121323	.04523124	.05366686	.06253696
56	.03708447	.04096730	.04500487	.05348010	.06238765
57	.03683114	.04073245	.04478932	.05330343	.06224744
58	.03658848	.04050810	.04458401	.05313626	.06211573
59	.03635593	.04029366	.04438836	.05297802	.06199200
60	.03613296	.04008862	.04420185	.05282818	.06187572
61	.03591908	.03989249	.04402398	.05268627	.06176642
62	.03571385	.03970480	.04385430	.05255183	.06166366
63	.03551682	.03952513	.04369237	.05242442	.06156703
64	.03532760	.03935308	.04353780	.05230365	.06147615
65	.03514581	.03918826	.04339019	.05218915	.06139066
66	.03497110	.03903031	.04324921	.05208057	.06131022
67	.03480313	.03887892	.04311451	.05197757	.06123454
68	.03464159	.03873375	.04298578	.05187986	.06116330
69	.03448618	.03859453	.04286272	.05178715	.06109625
70	.03433663	.03846095	.04274506	.05169915	.06103313
71	.03419266	.03833277	.04263253	.05161563	.06097370
72	.03405404	.03820973	.04252489	.05153633	.06091774
73	.03392053	.03809160	.04242190	.05146103	.06086505
74	.03379191	.03797816	.04232334	.05138953	.06081542
75	.03366796	.03786919	.04222900	.05132161	.06076867
76	.03354849	.03776450	.04213868	.05125709	.06072463
77	.03343331	.03766390	.04205221	.05119580	.06068315
78	.03332224	.03756721	.04196939	.05113757	.06064407
79	.03321510	.03747426	.04189007	.05108222	.06060724
80	.03311175	.03738489	.04181408	.05102963	.06057254
81	.03301201	.03729894	.04174127	.05097963	.06053984
82	.03291576	.03721628	.04167150	.05093211	.06050903
83	.03282284	.03713676	.04160463	.05088694	.06047998
84	.03273313	.03706025	.04154054	.05084399	.06045261
85	.03264650	.03698662	.04147909	.05080316	.06042681
86	.03256284	.03691576	.04142018	.05076433	.06040249
87	.03248202	.03684756	.04136370	.05072740	.06037956
88	.03240393	.03678190	.04130953	.05069228	.06035795
89	.03232848	.03671868	.04125758	.05065888	.06033757
90	.03225556	.03665781	.04120775	.05062711	.06031836
91	.03218508	.03659919	.04115995	.05059689	.06030025
92	.03211695	.03654273	.04111410	.05056815	.06028318
93	.03205107	.03648834	.04107010	.05054080	.06026708
94	.03198737	.03643594	.04102789	.05051478	.06025190
95	.03192577	.03638546	.04098738	.05049003	.06023758
96	.03186619	.03633682	.04094850	.05046648	.06022408
97	.03180856	.03628995	.04091119	.05044407	.06021135
98	.03175281	.03624478	.04087538	.05042274	.06019935
99	.03169886	.03620124	.04084100	.05040245	.06018803
100	.03164667	.03615927	.04080800	.05038314	.06017736
101	.03159615	.03611881	.04077632	.05036476	.06016729
102	.03154727	.03607981	.04074590	.05034727	.06015780
103	.03149995	.03604221	.04071670	.05033062	.06014884
104	.03145414	.03600595	.04068866	.05031478	.06014040
105	.03141078	.03597099	.04066173	.05029970	.06013243
Perp.	.03000000	.03500000	.04000000	.05000000	.06000000

TABLE VIII.

LOGARITHMS OF THE PRESENT VALUE OF £1, PAYABLE ANY NUMBER OF
YEARS HENCE, NOT EXCEEDING 105.

Years.	Log. v^x 8 per cent.	Log. v^x 8½ per cent.	Log. v^x 4 per cent.	Log. v^x 5 per cent.	Log. v^x 6 per cent.
1	9.987 1628	9.985 0597	9.982 9667	9.978 8107	9.974 6941
2	9.974 3256	9.970 1193	9.965 9333	9.957 6214	9.949 3883
3	9.961 4883	9.955 1790	9.948 9000	9.936 4321	9.924 0824
4	9.948 6511	9.940 2386	9.931 8666	9.915 2428	9.898 7765
5	9.935 8139	9.925 2983	9.914 8333	9.894 0535	9.873 4707
6	9.922 9767	9.910 3579	9.897 8000	9.872 8642	9.848 1648
7	9.910 1394	9.895 4176	9.880 7666	9.851 6749	9.822 8589
8	9.897 3022	9.880 4772	9.863 7333	9.830 4856	9.797 5531
9	9.884 4650	9.865 5369	9.846 6999	9.809 2963	9.772 2472
10	9.871 6278	9.850 5965	9.829 6666	9.788 1070	9.746 9413
11	9.858 7905	9.835 6562	9.812 6333	9.766 9177	9.721 6355
12	9.845 9533	9.820 7158	9.795 5999	9.745 7284	9.696 3296
13	9.833 1161	9.805 7755	9.778 5666	9.724 5391	9.671 0238
14	9.820 2789	9.790 8351	9.761 5332	9.703 3498	9.645 7179
15	9.807 4416	9.775 8948	9.744 4999	9.682 1605	9.620 4120
16	9.794 6044	9.760 9544	9.727 4666	9.660 9712	9.595 1062
17	9.781 7672	9.746 0141	9.710 4332	9.639 7819	9.569 8003
18	9.768 9300	9.731 0737	9.693 3999	9.618 5926	9.544 4944
19	9.756 0927	9.716 1334	9.676 3666	9.597 4033	9.519 1886
20	9.743 2555	9.701 1930	9.659 3332	9.576 2140	9.493 8827
21	9.730 4183	9.686 2527	9.642 2999	9.555 0247	9.468 5768
22	9.717 5811	9.671 3123	9.625 2665	9.533 8354	9.443 2710
23	9.704 7438	9.656 3720	9.608 2332	9.512 6461	9.417 9651
24	9.691 9066	9.641 4316	9.591 1999	9.491 4568	9.392 6592
25	9.679 0694	9.626 4913	9.574 1665	9.470 2675	9.367 3534
26	9.666 2322	9.611 5509	9.557 1332	9.449 0782	9.342 0475
27	9.653 3949	9.596 6106	9.540 0998	9.427 8889	9.316 7416
28	9.640 5577	9.581 6702	9.523 0665	9.406 6996	9.291 4358
29	9.627 7205	9.566 7299	9.506 0332	9.385 5103	9.266 1299
30	9.614 8833	9.551 7895	9.488 9998	9.364 3210	9.240 8240
31	9.602 0460	9.536 8492	9.471 9665	9.343 1317	9.215 5182
32	9.589 2088	9.521 9088	9.454 9331	9.321 9424	9.190 2123
33	9.576 3716	9.506 9685	9.437 8998	9.300 7531	9.164 9064
34	9.563 5344	9.492 0281	9.420 8665	9.279 5638	9.139 6006
35	9.550 6971	9.477 0878	9.403 8331	9.258 3745	9.114 2947
36	9.537 8599	9.462 1474	9.386 7998	9.237 1852	9.088 9889
37	9.525 0227	9.447 2071	9.369 7664	9.215 9959	9.063 6830
38	9.512 1855	9.432 2667	9.352 7331	9.194 8066	9.038 3771
39	9.499 3482	9.417 3264	9.335 6998	9.173 6173	9.013 0713
40	9.486 5110	9.402 3860	9.318 6664	9.152 4280	8.987 7654
41	9.473 6738	9.387 4457	9.301 6331	9.131 2387	8.962 4595
42	9.460 8366	9.372 5053	9.284 5997	9.110 0494	8.937 1537
43	9.447 9993	9.357 5650	9.267 5664	9.088 8601	8.911 8478
44	9.435 1621	9.342 6246	9.250 5331	9.067 6708	8.886 5419
45	9.422 3249	9.327 6843	9.233 4997	9.046 4815	8.861 2361
46	9.409 4877	9.312 7439	9.216 4664	9.025 2922	8.835 9302
47	9.396 6504	9.297 8036	9.199 4331	9.004 1029	8.810 6243
48	9.383 8132	9.282 8632	9.182 3997	8.982 9136	8.785 3184
49	9.370 9760	9.267 9229	9.165 3664	8.961 7243	8.760 0126
50	9.358 1388	9.252 9825	9.148 3330	8.940 5350	8.734 7067
51	9.345 3015	9.238 0422	9.131 2997	8.919 3457	8.709 4009
52	9.332 4643	9.223 1018	9.114 2664	8.898 1564	8.684 0950
53	9.319 6271	9.208 1615	9.097 2330	8.876 9671	8.658 7891

TABLE VIII.

LOGARITHMS OF THE PRESENT VALUE OF £1, PAYABLE ANY NUMBER OF
YEARS HENCE, NOT EXCEEDING 105.

Years.	Log. v^s 3 per cent.	Log. v^s 3½ per cent.	Log. v^s 4 per cent.	Log. v^s 5 per cent.	Log. v^s 6 per cent.
54	9.306 7899	9.193 2211	9.080 1997	8.855 7779	8.633 4833
55	9.293 9526	9.178 2808	9.063 1663	8.834 5886	8.608 1774
56	9.281 1154	9.163 3404	9.046 1330	8.813 3993	8.582 8715
57	9.268 2782	9.148 4001	9.029 0997	8.792 2100	8.557 5657
58	9.255 4410	9.133 4597	9.012 0663	8.771 0207	8.532 2598
59	9.242 6037	9.118 5194	8.995 0330	8.749 8314	8.506 9539
60	9.229 7665	9.103 5790	8.977 9996	8.728 6421	8.481 6481
61	9.216 9293	9.088 6387	8.960 9663	8.707 4528	8.456 3422
62	9.204 0921	9.073 6983	8.943 9330	8.686 2635	8.431 0364
63	9.191 2548	9.058 7580	8.926 8996	8.665 0742	8.405 7305
64	9.178 4176	9.043 8176	8.909 8663	8.643 8849	8.380 4246
65	9.165 5804	9.028 8773	8.892 8329	8.622 6956	8.355 1188
66	9.152 7432	9.013 9369	8.875 7996	8.601 5063	8.329 8129
67	9.139 9059	8.998 9966	8.858 7663	8.580 3170	8.304 5070
68	9.127 0687	8.984 0562	8.841 7329	8.559 1277	8.279 2012
69	9.114 2315	8.969 1159	8.824 6996	8.537 9384	8.253 8953
70	9.101 3943	8.954 1755	8.807 6662	8.516 7491	8.228 5894
71	9.088 5570	8.939 2352	8.790 6329	8.495 5598	8.203 2836
72	9.075 7198	8.924 2948	8.773 5996	8.474 3705	8.177 9777
73	9.062 8826	8.909 3545	8.756 5662	8.453 1812	8.152 6718
74	9.050 0454	8.894 4141	8.739 5329	8.431 9919	8.127 3660
75	9.037 2081	8.879 4738	8.722 4996	8.410 8026	8.102 0601
76	9.024 3709	8.864 5334	8.705 4662	8.389 6133	8.076 7542
77	9.011 5337	8.849 5931	8.688 4329	8.368 4240	8.051 4484
78	8.998 6965	8.834 6527	8.671 3995	8.347 2347	8.026 1425
79	8.985 8592	8.819 7124	8.654 3662	8.326 0454	8.000 8366
80	8.973 0220	8.804 7720	8.637 3329	8.304 8561	7.975 5308
81	8.960 1848	8.789 8317	8.620 2995	8.283 6668	7.950 2249
82	8.947 3476	8.774 8913	8.603 2662	8.262 4775	7.924 9190
83	8.934 5103	8.759 9510	8.586 2328	8.241 2882	7.899 6132
84	8.921 6731	8.745 0106	8.569 1995	8.220 0989	7.874 3073
85	8.908 8359	8.730 0703	8.552 1662	8.198 9096	7.849 0015
86	8.895 9987	8.715 1299	8.535 1328	8.177 7203	7.823 6956
87	8.883 1615	8.700 1896	8.518 0995	8.156 5310	7.798 3897
88	8.870 3242	8.685 2492	8.501 0661	8.135 3417	7.773 0839
89	8.857 4870	8.670 3089	8.484 0328	8.114 1524	7.747 7780
90	8.844 6498	8.655 3685	8.466 9995	8.092 9631	7.722 4721
91	8.831 8126	8.640 4282	8.449 9661	8.071 7738	7.697 1663
92	8.818 9753	8.625 4878	8.432 9328	8.050 5845	7.671 8604
93	8.806 1381	8.610 5475	8.415 8994	8.029 3952	7.646 5545
94	8.793 3009	8.595 6071	8.398 8661	8.008 2059	7.621 2487
95	8.780 4637	8.580 6668	8.381 8328	7.987 0166	7.595 9428
96	8.767 6264	8.565 7264	8.364 7994	7.965 8273	7.570 6369
97	8.754 7892	8.550 7861	8.347 7661	7.944 6380	7.545 3311
98	8.741 9520	8.535 8457	8.330 7327	7.923 4487	7.520 0252
99	8.729 1148	8.520 9054	8.313 6994	7.902 2594	7.494 7193
100	8.716 2775	8.505 9650	8.296 6661	7.881 0701	7.469 4135
101	8.703 4403	8.491 0247	8.279 6327	7.859 8808	7.444 1076
102	8.690 6031	8.476 0843	8.262 5994	7.838 6915	7.418 8017
103	8.677 7659	8.461 1440	8.245 5661	7.817 5022	7.393 4959
104	8.664 9286	8.446 2036	8.228 5327	7.796 3129	7.368 1900
105	8.652 0914	8.431 2633	8.211 4994	7.775 1236	7.342 8841

NUMBERS OFTEN USED IN CALCULATIONS.

Interest 3 per cent; $v = \frac{1}{1.03} = .97087379$; Log. = $\overline{1.987\ 1628}$

Interest $3\frac{1}{2}$ per cent; $v = \frac{1}{1.035} = .96618357$; Log. = $\overline{1.985\ 0597}$

Interest 4 per cent; $v = \frac{1}{1.04} = .96153846$; Log. = $\overline{1.982\ 9667}$

Interest 5 per cent; $v = \frac{1}{1.05} = .95238095$; Log. = $\overline{1.978\ 8107}$

Interest 6 per cent; $v = \frac{1}{1.06} = .94339623$; Log. = $\overline{1.974\ 6941}$

Interest 3 per cent; $1 - v = d = .02912621$; Log. = $\overline{2.464\ 2840}$

Interest $3\frac{1}{2}$ per cent; $1 - v = d = .03381643$; Log. = $\overline{2.529\ 1277}$

Interest 4 per cent; $1 - v = d = .03846154$; Log. = $\overline{2.585\ 0267}$

Interest 5 per cent; $1 - v = d = .04761905$; Log. = $\overline{2.677\ 7807}$

Interest 6 per cent; $1 - v = d = .05660377$; Log. = $\overline{2.752\ 8454}$

LIFE TABLES.

TABLE IX.

SHOWING THE RATE OF MORTALITY AT CARLISLE, EXPECTATION OF LIFE,
ETC., FORMING THE BASIS OF THE LIFE ASSURANCE TABLES.

AGE.	Number DYING in each year of age, 0—1, 1—2 to 104—105.	Number LIVING at each Age, out of 10,000 Born.	POPULATION, or the LIVING in each year of Age, 0—1, 1—2, etc., kept up by 10,000 Annual Births.	POPULATION, at each Age x and upwards; also number of years l_x will live.	Mean AFTER- LIFETIME of Age x , or EXPECTATION of Life.	Proportion which survive, or PROBABILITY of living one year.	Proportion which die in one year.
(x)	d_x	$\Sigma d_x =$ l_x	$\frac{1}{2} (l_x + l_{x+1})$ $= l_x + \frac{1}{2}$	$\Sigma l_x + \frac{1}{2} =$ Q_x	$\frac{Q_x}{l_x}$	$\frac{l_{x+1}}{l_x}$	$\frac{d_x}{l_x}$
0	1539	10000	9230.5	387213.0	38.721	.8461000	.1539000
1	682	8461	8120.0	377982.5	44.674	.9193949	.0806051
2	505	7779	7526.5	369862.5	47.546	.9350816	.0649184
3	276	7274	7136.0	362336.0	49.812	.9620566	.0379434
4	201	6998	6897.5	355200.0	50.757	.9712775	.0287225
5	121	6797	6736.5	348302.5	51.244	.9821900	.0178100
6	82	6676	6635.0	341566.0	51.163	.9877172	.0122828
7	58	6594	6565.0	334931.0	50.793	.9912041	.0087959
8	43	6536	6514.5	328366.0	50.240	.9934211	.0065789
9	33	6493	6476.5	321851.5	49.569	.9949176	.0050824
10	29	6460	6445.5	315375.0	48.820	.9955108	.0044892
11	31	6431	6415.5	308929.5	48.038	.9951796	.0048204
12	32	6400	6384.0	302514.0	47.268	.9950000	.0050000
13	33	6368	6351.5	296130.0	46.503	.9948178	.0051822
14	35	6335	6317.5	289778.5	45.742	.9944751	.0055249
15	39	6300	6280.5	283461.0	44.994	.9938095	.0061905
16	42	6261	6240.0	277180.5	44.271	.9932918	.0067082
17	43	6219	6197.5	270940.5	43.567	.9930857	.0069143
18	43	6176	6154.5	264743.0	42.866	.9930376	.0069624
19	43	6133	6111.5	258588.5	42.163	.9929890	.0070110
20	43	6090	6068.5	252477.0	41.458	.9929392	.0070608
21	42	6047	6026.0	246408.5	40.749	.9930544	.0069456
22	42	6005	5984.0	240382.5	40.030	.9930058	.0069942
23	42	5963	5942.0	234398.5	39.309	.9929566	.0070434
24	42	5921	5900.0	228456.5	38.584	.9929066	.0070934
25	43	5879	5857.5	222556.5	37.856	.9926858	.0073142
26	43	5836	5814.5	216699.0	37.131	.9926319	.0073681
27	45	5793	5770.5	210884.5	36.403	.9922320	.0077680
28	50	5748	5723.0	205114.0	35.684	.9913013	.0086987
29	56	5698	5670.0	199391.0	34.993	.9901720	.0098280
30	57	5642	5613.5	193721.0	34.336	.9898972	.0101028
31	57	5585	5556.5	188107.5	33.681	.9897941	.0102059
32	56	5528	5500.0	182551.0	33.023	.9898697	.0101303
33	55	5472	5444.5	177051.0	32.356	.9899488	.0100512
34	55	5417	5389.5	171606.5	31.679	.9898468	.0101532
35	55	5362	5334.5	166217.0	30.999	.9897426	.0102574
36	56	5307	5279.0	160882.5	30.315	.9894479	.0105521
37	57	5251	5222.5	155603.5	29.633	.9891449	.0108551
38	58	5194	5165.0	150381.0	28.953	.9888333	.0111667
39	61	5136	5105.5	145216.0	28.274	.9881231	.0118769
40	66	5075	5042.0	140110.5	27.608	.9869951	.0130049
41	69	5009	4974.5	135068.5	26.965	.9862248	.0137752
42	71	4940	4904.5	130094.0	26.335	.9856275	.0143725
43	71	4869	4833.5	125189.5	25.712	.9854180	.0145820
44	71	4798	4762.5	120356.0	25.085	.9852022	.0147978
45	70	4727	4692.0	115593.5	24.454	.9851915	.0148085
46	69	4657	4622.5	110901.5	23.814	.9851836	.0148164
47	67	4588	4554.5	106279.0	23.165	.9853967	.0146033
48	63	4521	4489.5	101724.5	22.500	.9860651	.0139349
49	61	4458	4427.5	97235.0	21.811	.9863167	.0136833
50	59	4397	4367.5	92807.5	21.107	.9865818	.0134182
51	62	4338	4307.0	88440.0	20.387	.9857077	.0142923
52	65	4276	4243.5	84133.0	19.676	.9847989	.0152011

TABLE IX.

SHOWING THE RATE OF MORTALITY AT CARLISLE, EXPECTATION OF LIFE,
ETC., FORMING THE BASIS OF THE LIFE ASSURANCE TABLES.

Age.	Number Dying in each year of Age, 0—1, 1—2 to 104—105.	Number Living at each Age, out of 10,000 Born.	POPULATION, OF the LIVING in each year of Age, 0—1, 1—2, etc., kept up by 10,000 Annual Births.	POPULATION, at each Age x and upwards; also number of years l_x will live.	Mean AFTER- LIFETIME of Age x , or EXPECTATION of Life.	Proportion which survive, or PROBABILITY of living one year.	Proportion which die in one year.
(x)	d_x	$\Sigma d_x =$ l_x	$\frac{1}{2}(l_x + l_{x+1})$ $= l_x + \frac{1}{2}$	$\Sigma l_x + \frac{1}{2} =$ Q_x	$\frac{Q_x}{l_x}$	$\frac{l_{x+1}}{l_x}$	$\frac{d_x}{l_x}$
53	68	4211	4177.0	79889.5	18.972	.9838518	.0161482
54	70	4143	4108.0	75712.5	18.275	.9831041	.0168959
55	73	4073	4036.5	71604.5	17.580	.9820771	.0179229
56	76	4000	3962.0	67568.0	16.892	.9810000	.0190000
57	82	3924	3883.0	63606.0	16.209	.9791030	.0208970
58	93	3842	3795.5	59723.0	15.545	.9757939	.0242061
59	106	3749	3696.0	55927.5	14.918	.9717258	.0282742
60	122	3643	3582.0	52231.5	14.337	.9665112	.0334888
61	126	3521	3458.0	48649.5	13.817	.9642147	.0357853
62	127	3395	3331.5	45191.5	13.311	.9625921	.0374079
63	125	3268	3205.5	41860.0	12.809	.9617503	.0382497
64	125	3143	3080.5	38654.5	12.299	.9602291	.0397709
65	124	3018	2956.0	35574.0	11.787	.9589132	.0410868
66	123	2894	2832.5	32618.0	11.271	.9574983	.0425017
67	123	2771	2709.5	29785.5	10.749	.9556117	.0443883
68	123	2648	2586.5	27076.0	10.225	.9535498	.0464502
69	124	2525	2463.0	24489.5	9.699	.9508911	.0491089
70	124	2401	2339.0	22026.5	9.174	.9483549	.0516451
71	134	2277	2210.0	19687.5	8.646	.9411506	.0588494
72	146	2143	2070.0	17477.5	8.156	.9318712	.0681288
73	156	1997	1919.0	15407.5	7.715	.9218828	.0781172
74	166	1841	1758.0	13488.5	7.327	.9098316	.0901684
75	160	1675	1595.0	11730.5	7.003	.9044776	.0955224
76	156	1515	1437.0	10135.5	6.690	.8970297	.1029703
77	146	1359	1286.0	8698.5	6.401	.8925681	.1074319
78	132	1213	1147.0	7412.5	6.111	.8911789	.1088211
79	128	1081	1017.0	6265.5	5.796	.8815911	.1184089
80	116	953	895.0	5248.5	5.507	.8782791	.1217209
81	112	837	781.0	4353.5	5.201	.8661888	.1338112
82	102	725	674.0	3572.5	4.928	.8593103	.1406897
83	94	623	576.0	2898.5	4.652	.8491171	.1508829
84	84	529	487.0	2322.5	4.390	.8412100	.1587900
85	78	445	406.0	1835.5	4.125	.8247191	.1752809
86	71	367	331.5	1429.5	3.895	.8065395	.1934605
87	64	296	264.0	1098.0	3.709	.7837838	.2162162
88	51	232	206.5	834.0	3.595	.7801724	.2198276
89	39	181	161.5	627.5	3.467	.7845304	.2154696
90	37	142	123.5	466.0	3.282	.7394366	.2605634
91	30	105	90.0	342.5	3.262	.7142857	.2857143
92	21	75	64.5	252.5	3.367	.7200000	.2800000
93	14	54	47.0	188.0	3.481	.7407408	.2592592
94	10	40	35.0	141.0	3.525	.7500000	.2500000
95	7	30	26.5	106.0	3.533	.7666667	.2333333
96	5	23	20.5	79.5	3.457	.7826087	.2173913
97	4	18	16.0	59.0	3.278	.7777778	.2222222
98	3	14	12.5	43.0	3.071	.7857143	.2142857
99	2	11	10.0	30.5	2.773	.8181818	.1818182
100	2	9	8.0	20.5	2.278	.7777778	.2222222
101	2	7	6.0	12.5	1.786	.7142857	.2857143
102	2	5	4.0	6.5	1.300	.6000000	.4000000
103	2	3	2.0	2.5	.833	.3333334	.6666666
104	1	1	0.5	.5	.500		

TABLE X.

LOGARITHMS OF THE RATE OF MORTALITY AT CARLISLE, EXPECTATION
OF LIFE, ETC.

AGE.	Logarithm of Number DYING in each year of Age, 0—1, 1—2 to 104—105.	Logarithm of Number LIVING at each Age, out of 10,000 Born.	Logarithm of POPULATION, or of the LIVING in each year of Age, 0—1, 1—2, etc., kept up by 10,000 Annual Births.	Logarithm of POPULATION at each Age x and upwards; or of number of years l_x will live.	Logarithm of PROPORTION which survive one year, or of PROBABILITY of living one year.	Cologarithm PROBABILITY of living one year.
(x)	λd_x	λl_x	$\lambda l_x + \frac{1}{2}$	$\lambda \Sigma l_x + \frac{1}{2}$ $= \lambda Q_x$	$\lambda \frac{l_x + 1}{l_x}$	$x \lambda \frac{l_x + 1}{l_x}$
0	3.187 2386	4.000 0000	3.965 2252	5.587 9500	9.927 4217	0.072 5783
1	2.833 7844	3.927 4217	3.909 5560	5.577 4717	9.963 5021	0.036 4979
2	2.703 2914	3.890 9238	3.876 5931	5.568 0403	9.970 8495	0.029 1505
3	2.440 9091	3.861 7733	3.853 4548	5.559 1115	9.983 2006	0.016 7994
4	2.303 1961	3.844 9739	3.838 6917	5.550 4730	9.987 3434	0.012 6566
5	2.082 7854	3.832 3173	3.828 4343	5.541 9566	9.992 1990	0.007 8010
6	1.913 8139	3.824 5163	3.821 8409	5.533 4746	9.994 6326	0.005 3674
7	1.763 4280	3.819 1489	3.817 2347	5.524 9553	9.996 1631	0.003 8369
8	1.633 4685	3.815 3120	3.813 8811	5.516 3582	9.997 1334	0.002 8666
9	1.518 5139	3.812 4454	3.811 3404	5.507 6556	9.997 7871	0.002 2129
10	1.462 3980	3.810 2325	3.809 2566	5.498 8273	9.998 0460	0.001 9540
11	1.491 3617	3.808 2785	3.807 2305	5.489 8594	9.997 9015	0.002 0985
12	1.505 1500	3.806 1800	3.805 0929	5.480 7455	9.997 8230	0.002 1770
13	1.518 5139	3.804 0031	3.802 8763	5.471 4824	9.997 7436	0.002 2564
14	1.544 0680	3.801 7466	3.800 5453	5.462 0661	9.997 5939	0.002 4061
15	1.591 0646	3.799 3405	3.797 9942	5.452 4933	9.997 3032	0.002 6968
16	1.623 2493	3.796 6437	3.795 1846	5.442 7627	9.997 0769	0.002 9231
17	1.633 4685	3.793 7206	3.792 2165	5.432 8739	9.996 9867	0.003 0133
18	1.633 4685	3.790 7073	3.789 1928	5.422 8245	9.996 9657	0.003 0343
19	1.633 4685	3.787 6730	3.786 1478	5.412 6091	9.996 9443	0.003 0557
20	1.633 4685	3.784 6173	3.783 0814	5.402 2218	9.996 9227	0.003 0773
21	1.623 2493	3.781 5400	3.780 0291	5.391 6557	9.996 9730	0.003 0270
22	1.623 2493	3.778 5130	3.776 9916	5.380 9028	9.996 9518	0.003 0482
23	1.623 2493	3.775 4648	3.773 9326	5.369 9548	9.996 9303	0.003 0697
24	1.623 2493	3.772 3951	3.770 8520	5.358 8035	9.996 9084	0.003 0916
25	1.633 4685	3.769 3035	3.767 7123	5.347 4403	9.996 8118	0.003 1882
26	1.633 4685	3.766 1153	3.764 5124	5.335 8569	9.996 7882	0.003 2118
27	1.653 2125	3.762 9035	3.761 2134	5.324 0446	9.996 6133	0.003 3867
28	1.698 9700	3.759 5168	3.757 6237	5.311 9953	9.996 2056	0.003 7944
29	1.748 1880	3.755 7224	3.753 5831	5.299 7056	9.995 7107	0.004 2893
30	1.755 8749	3.751 4331	3.749 2337	5.287 1767	9.995 5901	0.004 4099
31	1.755 8749	3.747 0232	3.744 8013	5.274 4062	9.995 5448	0.004 4552
32	1.748 1880	3.742 5680	3.740 3627	5.261 3842	9.995 5781	0.004 4219
33	1.740 3627	3.738 1461	3.735 9580	5.248 0984	9.995 6127	0.004 3873
34	1.740 3627	3.733 7588	3.731 5485	5.234 5338	9.995 5680	0.004 4320
35	1.740 3627	3.729 3268	3.727 0937	5.220 6754	9.995 5223	0.004 4777
36	1.748 1880	3.724 8491	3.722 5517	5.206 5088	9.995 3929	0.004 6071
37	1.755 8749	3.720 2420	3.717 8784	5.192 0194	9.995 2599	0.004 7441
38	1.763 4280	3.715 5019	3.713 0703	5.177 1930	9.995 1231	0.004 8769
39	1.785 3298	3.710 6250	3.708 0383	5.162 0144	9.994 8110	0.005 1890
40	1.819 5439	3.705 4360	3.702 6028	5.146 4706	9.994 3150	0.005 6850
41	1.838 8491	3.699 7510	3.696 7494	5.130 5541	9.993 9759	0.006 0241
42	1.851 2583	3.693 7269	3.690 5947	5.113 2573	9.993 7129	0.006 2871
43	1.851 2583	3.687 4398	3.684 2617	5.097 5678	9.993 6204	0.006 3796
44	1.851 2583	3.681 0602	3.677 8350	5.080 4678	9.993 5254	0.006 4746
45	1.845 0980	3.674 5856	3.671 3580	5.062 9335	9.993 5206	0.006 4794
46	1.838 8491	3.668 1062	3.664 8769	5.044 9374	9.993 5172	0.006 4828
47	1.826 0748	3.661 6234	3.658 4407	5.026 4474	9.993 6111	0.006 3889
48	1.799 3405	3.655 2345	3.652 1980	5.007 4255	9.993 9056	0.006 0944
49	1.785 3298	3.649 1401	3.646 1586	4.987 8226	9.994 0164	0.005 9836
50	1.770 8520	3.643 1565	3.640 2329	4.967 5831	9.994 1330	0.005 8670
51	1.792 5917	3.637 2895	3.634 1749	4.946 6487	9.993 7482	0.006 2518
52	1.812 9134	3.631 0377	3.627 7242	4.924 9664	9.993 3475	0.006 6525

TABLE X.

LOGARITHMS OF THE RATE OF MORTALITY AT CARLISLE, EXPECTATION
OF LIFE, ETC.

Age.	Logarithm of Number DYING in each year of Age 0-1, 1-2, to 104-105.	Logarithm of Number LIVING at each Age, out of 10,000 Born.	Logarithm of POPULATION, or of the LIVING in each year of Age, 0-1, 1-2, etc., kept up by 10,000 Annual Births.	Logarithm of POPULATION, at each Age x and <i>upwards</i> ; or of number of years l_x will live.	Logarithm of PROPORTION which survive one year, or of PROBABILITY of living one year.	Cologarithm PROBABILITY of living one year.
(x)	λd_x	λl_x	λl_{x+1}	$\lambda \Sigma l_{x+1}$ $= \lambda Q_x$	$\lambda \frac{l_{x+1}}{l_x}$	$x \lambda \frac{l_{x+1}}{l_x}$
53	1.832 5089	3.624 3852	3.620 8645	4.902 4897	9.992 9297	0.007 0703
54	1.845 0980	3.617 3149	3.613 6304	4.879 1676	9.992 5995	0.007 4005
55	1.861 3229	3.609 9144	3.606 0050	4.854 9403	9.992 1456	0.007 8544
56	1.880 8136	3.602 0600	3.597 9145	4.829 7411	9.991 6690	0.008 3310
57	1.913 8139	3.593 7290	3.589 1674	4.803 4981	9.990 8284	0.009 1716
58	1.968 4829	3.584 5574	3.579 2690	4.776 1416	9.989 3580	0.010 6420
59	2.025 3059	3.573 9154	3.567 7320	4.747 6254	9.987 5438	0.012 4562
60	2.086 3598	3.561 4592	3.554 1256	4.717 9325	9.985 2068	0.014 7932
61	2.100 3705	3.546 6660	3.538 8250	4.687 0784	9.984 1738	0.015 8262
62	2.103 8037	3.530 8398	3.522 6398	4.655 0568	9.983 4422	0.016 5578
63	2.096 9100	3.514 2820	3.505 8958	4.621 7992	9.983 0624	0.016 9376
64	2.096 9100	3.497 3444	3.488 6212	4.587 2001	9.982 3748	0.017 6252
65	2.093 4217	3.479 7192	3.470 7044	4.551 1327	9.981 7793	0.018 2207
66	2.089 9051	3.461 4985	3.452 1699	4.513 4573	9.981 1380	0.018 8620
67	2.089 9051	3.442 6365	3.432 8892	4.474 0049	9.980 2815	0.019 7185
68	2.089 9051	3.422 9180	3.412 7125	4.432 5845	9.979 3434	0.020 6566
69	2.093 4217	3.402 2614	3.391 4644	4.388 9800	9.978 1308	0.021 8692
70	2.093 4217	3.380 3922	3.369 0302	4.342 9455	9.976 9708	0.023 0292
71	2.127 1048	3.357 3630	3.344 3923	4.294 1906	9.973 6592	0.026 3408
72	2.164 3529	3.331 0222	3.315 9703	4.242 4793	9.969 3559	0.030 6441
73	2.193 1246	3.300 3781	3.283 0750	4.187 7322	9.964 6757	0.035 3243
74	2.220 1081	3.265 0538	3.245 0189	4.129 9637	9.958 9610	0.041 0390
75	2.204 1200	3.224 0148	3.202 7607	4.069 3165	9.956 3978	0.043 6022
76	2.193 1246	3.180 4126	3.157 4568	4.005 8452	9.952 8069	0.047 1931
77	2.164 3529	3.133 2195	3.109 2410	3.939 4444	9.950 6413	0.049 3587
78	2.120 5739	3.083 8608	3.059 5634	3.869 9047	9.949 9649	0.050 0351
79	2.107 2100	3.033 8257	3.007 3210	3.796 9557	9.945 2672	0.054 7328
80	2.064 4580	2.979 0929	2.951 8230	3.720 0352	9.943 6326	0.056 3674
81	2.049 2180	2.922 7255	2.892 6510	3.638 8385	9.937 6125	0.062 3875
82	2.008 6002	2.860 3380	2.828 6599	3.552 9722	9.934 1500	0.065 8500
83	1.973 1279	2.794 4880	2.760 4225	3.462 1733	9.928 9677	0.071 0323
84	1.924 2793	2.723 4557	2.687 5290	3.365 9557	9.924 9043	0.075 0957
85	1.892 0946	2.648 3600	2.608 5260	3.263 7544	9.916 3061	0.083 6939
86	1.851 2583	2.564 6661	2.520 4835	3.155 1842	9.906 6256	0.093 3744
87	1.806 1800	2.471 2917	2.421 6039	3.040 6023	9.894 1963	0.105 8037
88	1.707 5702	2.365 4880	2.314 9201	2.921 1661	9.892 1906	0.107 8094
89	1.591 0646	2.257 6786	2.208 1725	2.797 6137	9.894 6097	0.105 3903
90	1.568 2017	2.152 2883	2.091 6670	2.668 3859	9.868 9010	0.131 0990
91	1.477 1213	2.021 1893	1.954 2425	2.534 6606	9.853 8720	0.146 1280
92	1.322 2193	1.875 0613	1.809 5597	2.402 2614	9.857 3325	0.142 6675
93	1.146 1280	1.732 3938	1.672 0979	2.274 1578	9.869 6662	0.130 3338
94	1.000 0000	1.602 0600	1.544 0680	2.149 2191	9.875 0613	0.124 9387
95	0.845 0980	1.477 1213	1.423 2459	2.025 3059	9.884 6065	0.115 3935
96	0.698 9700	1.361 7278	1.311 7539	1.900 3671	9.893 5447	0.106 4553
97	0.602 0600	1.255 2725	1.204 1200	1.770 8520	9.890 8555	0.109 1445
98	0.477 1213	1.146 1280	1.096 9100	1.633 4685	9.895 2647	0.104 7353
99	0.301 0300	1.041 3927	1.000 0000	1.484 2998	9.912 8498	0.087 1502
100	0.301 0300	0.954 2425	0.903 0900	1.311 7539	9.890 8555	0.109 1445
101	0.301 0300	0.845 0980	0.778 1513	1.096 9100	9.853 8720	0.146 1280
102	0.301 0300	0.698 9700	0.602 0600	0.812 9134	9.778 1513	0.221 8487
103	0.301 0300	0.477 1213	0.301 0300	0.397 9400	9.522 8787	0.477 1213
104	0.000 0000	0.000 0000	0.698 9700	0.698 9700	0.000 0000	

TABLE XI.

COMMUTATION TABLES FOR SINGLE LIVES.

Age.	$l_x \times v^x =$	$\Sigma D_x =$	$\Sigma N_x =$	$d_x \times v^{x+1} =$	$\Sigma C_x =$	$\Sigma M_x =$
	D_x	N_x	S_x	C_x	M_x	R_x
0	10000.0000	183198.2348	3885247.9466	1494.175	4664.1296	70035.6729
1	8214.5631	173198.2348	3702049.7118	642.8506	3169.9546	65371.5433
2	7332.4536	164983.6717	3528851.4770	462.1465	2527.1040	62201.5887
3	6656.7404	157651.2181	3363867.8053	245.2225	2064.9575	59674.4847
4	6217.6324	150994.4777	3206216.5872	173.3844	1819.7350	57609.5272
5	5863.1519	144776.8453	3055222.1095	101.3356	1646.3506	55789.7922
6	5591.0449	138913.6934	2910445.2642	66.6735	1545.0150	54143.4416
7	5361.5254	133322.6485	2771531.5708	45.78573	1478.34147	52598.42659
8	5159.5788	127961.1231	2638208.9223	32.95592	1432.55574	51120.08512
9	4976.3438	122801.5443	2510247.7992	24.55510	1399.59982	49687.52938
10	4806.8467	117825.2005	2387446.2549	20.95021	1375.04472	48287.92956
11	4645.8912	113018.3538	2269621.0544	21.74277	1354.09451	46912.88484
12	4488.8312	108372.4626	2156602.7006	21.79044	1332.35174	45558.79033
13	4336.2981	103883.6314	2048230.2380	21.81689	1310.56130	44226.43859
14	4188.1813	99547.3333	1944346.6066	22.46517	1288.74441	42915.87729
15	4043.7303	95359.1520	1844799.2733	24.30351	1266.27924	41627.13288
16	3901.6482	91315.4217	1749440.1213	25.41069	1241.97573	40360.85364
17	3762.5973	87413.7735	1658124.6966	25.5797	1216.56504	39118.87791
18	3627.7491	83651.1762	1570710.9261	24.52230	1191.30707	37902.31287
19	3497.5642	80023.4271	1487059.7499	23.80806	1166.78477	36711.00580
20	3371.8854	76525.8629	1407036.3228	23.11462	1142.97671	35544.22103
21	3250.5605	73153.9775	1330510.4599	21.91949	1119.86209	34401.24432
22	3133.9645	69903.4170	1257356.4824	21.28105	1097.94260	33281.38223
23	3021.4029	66769.4525	1187453.0654	20.66122	1076.66155	32183.43963
24	2912.7397	63748.0496	1120683.6129	20.05944	1056.00033	31106.77808
25	2807.8432	60835.3099	1056935.5633	19.93888	1035.94089	30050.77775
26	2706.1224	58027.4667	996100.2534	19.35813	1016.00201	29014.83686
27	2607.9452	55321.3443	938072.7867	19.66845	996.64388	27998.83485
28	2512.3172	52713.3991	882751.4424	21.21732	976.97543	27002.19097
29	2417.9256	50201.0819	830038.0433	23.07126	955.75811	26025.21554
30	2324.4293	47783.1563	779836.9614	22.79927	932.68685	25069.45743
31	2233.9282	45458.7270	732053.8051	22.13522	909.88758	24136.77058
32	2146.7271	43224.7988	686595.0781	21.11347	887.75236	23226.88300
33	2063.0876	41078.0717	643370.2793	20.13247	866.63889	22339.13064
34	1982.8652	39014.9841	602292.2076	19.54609	846.50642	21472.49175
35	1905.5658	37032.1189	563277.2235	18.97678	826.96033	20625.98533
36	1831.0871	35126.5531	526245.1046	18.75904	807.98355	19799.02500
37	1758.9954	33295.4660	491118.5515	18.53789	789.22451	18991.04145
38	1689.2246	31536.4706	457823.0855	18.31370	770.68662	18201.81694
39	1621.7102	29847.2460	426286.6149	18.69996	752.37292	17431.13032
40	1555.7760	28225.5358	396439.3689	19.64245	733.67296	16678.75740
41	1490.8187	26660.7598	368213.8331	19.93819	714.02951	15945.08444
42	1427.4586	25178.9411	341544.0733	19.91855	694.09132	15231.05493
43	1365.9636	23751.4825	316365.1322	19.33839	674.17277	14536.96361
44	1306.8398	22385.5189	292613.6497	18.77514	654.83438	13862.79024
45	1250.0014	21078.6791	270228.1308	17.97156	636.05924	13207.95646
46	1195.6220	19828.6777	249149.4517	17.19886	618.08768	12571.89722
47	1143.5992	18633.0557	229320.7740	16.21392	600.88882	11953.80954
48	1094.0766	17489.4565	210687.7183	14.80187	584.67490	11352.92072
49	1047.4084	16395.3799	193198.2618	13.91453	569.87303	10768.24582
50	1002.9868	15347.9715	176802.8819	13.06632	555.95850	10198.37279
51	960.70729	14344.98471	161454.91043	13.33079	542.89218	9642.41299
52	919.39473	13384.27742	147109.92572	13.56877	529.56139	9099.52211

TABLE XI.

COMMUTATION TABLES FOR SINGLE LIVES.

Age.	$l_x v^x =$	$\Sigma D_x =$	$\Sigma N_x =$	$d_x v^{x+1} =$	$\Sigma C_x =$	$\Sigma M_x =$
	D_x	N_x	S_x	C_x	M_x	R_x
53	879.04747	12464.88269	133725.64830	13.78157	515.99262	8569.96072
54	839.66258	11585.83522	121260.76561	13.77370	502.21105	8053.96810
55	801.43268	10746.17264	109674.93039	13.94564	488.43735	7551.75705
56	764.14435	9944.73996	98928.75775	14.09587	474.49171	7063.31970
57	727.79185	9180.59561	88984.01779	14.76573	460.39584	6588.82799
58	691.82830	8452.80376	79803.42218	16.25873	445.63011	6128.43215
59	655.41923	7760.97546	71350.61842	17.99171	429.37138	5682.80204
60	618.33764	7105.55623	63589.64296	20.10430	411.37967	5253.43066
61	580.22350	6487.21859	56484.08673	20.15870	391.27537	4842.05099
62	543.16509	5906.99509	49996.86814	19.72689	371.11667	4450.77562
63	507.61785	5363.83000	44089.87305	18.85070	351.38978	4079.65895
64	473.98216	4856.21215	38726.04305	18.30165	332.53908	3728.26917
65	441.87520	4382.22999	33869.83090	17.62645	314.23743	3395.73009
66	411.37859	3940.35479	29487.60091	16.97505	296.61098	3081.49266
67	382.42164	3528.97620	25547.24612	16.48063	279.63593	2784.88168
68	354.80252	3146.55456	22018.26992	16.00061	263.15530	2505.24575
69	328.46785	2791.75204	18871.71536	15.66087	247.15469	2242.09045
70	303.23996	2463.28419	16079.96332	15.20473	231.49382	1994.93576
71	279.20299	2160.04423	13616.67913	15.95235	216.28909	1763.44194
72	255.11852	1880.84124	11456.63490	16.87468	200.33674	1547.15285
73	230.81321	1625.72272	9575.79366	17.50532	183.46206	1346.81611
74	206.85118	1394.90951	7950.07094	18.08490	165.95674	1163.35405
75	182.48323	1188.32433	6555.16143	16.92353	147.87184	997.39731
76	160.24465	1005.84110	5366.83710	16.01984	130.94831	849.52547
77	139.55749	845.59645	4360.99600	14.55625	114.92847	718.57716
78	120.93647	706.03896	3515.39955	12.77712	100.37222	603.64869
79	104.63692	585.10249	2809.36059	12.02907	87.59510	503.27647
80	89.560173	480.465573	2224.25810	10.58383	75.56603	415.68137
81	76.367796	390.905400	1743.792527	9.921232	64.982204	340.115343
82	64.22259	314.537604	1352.887127	8.772240	55.060972	275.133139
83	53.579468	250.315345	1038.349523	7.848759	46.288732	220.072167
84	44.170142	196.735877	788.034178	6.809500	38.439973	173.783435
85	36.074134	152.565735	591.298301	6.138939	31.630473	135.343462
86	28.884492	116.491601	438.732566	5.425250	25.491534	103.712989
87	22.617946	87.607109	322.240965	4.747929	20.066284	78.221455
88	17.211242	64.989163	234.633856	3.673307	15.318355	58.155171
89	13.036637	47.77921	169.644693	2.727184	11.645048	42.836816
90	9.929745	34.741284	121.866772	2.511969	8.917864	31.191768
91	7.128561	24.811539	87.125488	1.977410	6.405895	22.273904
92	4.943523	17.682978	62.313950	1.343870	4.428485	15.868009
93	3.455667	12.739455	44.630971	.869819	3.084615	11.439524
94	2.485197	9.283788	31.891517	.603203	2.214796	8.354909
95	1.809610	6.798591	22.607729	.409944	1.611592	6.140113
96	1.346959	4.988981	15.809138	.284288	1.201649	4.528521
97	1.023438	3.642023	10.820157	.220807	.917360	3.326872
98	.772822	2.618584	7.178134	.160781	.696553	2.409512
99	.589532	1.845761	4.559550	.104066	.535772	1.712959
100	.468296	1.256229	2.713789	.101035	.431706	1.177187
101	.353621	.787934	1.457559	.098092	.330672	.745480
102	.245230	.434312	.669626	.095235	.232580	.414809
103	.142852	.189083	.235313	.092461	.137345	.182229
104	.046230	.046230	.046230	.044884	.044884	.044884

TABLE XIII.

COMMUTATION TABLES FOR SINGLE LIVES.

AGE.	$l_x \times v^x =$	$\Sigma D_x =$	$\Sigma N_x =$	$d_x \times v^{x+1} =$	$\Sigma C_x =$	$\Sigma M_x =$
	D_x	N_x	S_x	C_x	M_x	R_x
0	10000.0000	152816.4338	2813942.0300	1479.808	4122.4452	44587.9711
1	8135.5769	142816.4338	2661123.5962	630.5474	2642.6372	40465.5259
2	7192.1228	134680.8569	2518307.1624	448.9432	2012.0898	37822.8887
3	6466.5595	127488.7341	2383626.3055	235.9259	1563.1466	35810.7989
4	5981.9197	121022.1746	2256137.5714	165.2074	1327.2207	34247.6523
5	5586.6385	115040.2549	2135115.3968	95.62807	1162.01335	32920.4316
6	5276.1398	109453.6164	2020075.1419	62.31326	1066.38528	31758.41825
7	5010.8981	104177.4766	1910621.5255	42.38003	1004.07202	30692.03297
8	4775.7912	99166.5785	1806444.0489	30.21123	961.69199	29687.96095
9	4561.8957	94390.7873	1707277.4704	22.29362	931.48076	28726.26896
10	4364.1445	89828.8916	1612886.6831	18.83785	909.18714	27794.78820
11	4177.4550	85464.7471	1523057.7915	19.36251	890.34929	26885.60106
12	3997.4211	81287.2921	1437593.0444	19.21817	870.98678	25995.25177
13	3824.4558	77289.8710	1356305.7523	19.05667	851.76841	25124.26499
14	3658.3046	73465.4152	1279015.8813	19.43425	832.71174	24272.49658
15	3498.1664	69807.1106	1205550.4661	20.82242	813.27749	23439.78484
16	3342.7991	66308.9442	1135743.3555	21.56167	792.45507	22626.50735
17	3192.6682	62966.1451	1069434.4113	21.22601	770.89340	21834.05228
18	3048.6473	59773.4769	1006468.2662	20.40963	749.66739	21063.15888
19	2910.9820	56724.8296	946694.7893	19.62464	729.25776	20313.49149
20	2779.3965	53813.8476	889969.9597	18.86985	709.63312	19584.23373
21	2653.6268	51034.4511	836156.1121	17.72212	690.76327	18874.60061
22	2533.8421	48380.8243	785121.6610	17.04050	673.04115	18183.83734
23	2419.3461	45846.9822	736740.8367	16.38510	656.00065	17510.79619
24	2309.9093	43427.6361	690893.8545	15.75491	639.61555	16854.79554
25	2205.3117	41117.7268	647466.2184	15.50964	623.86064	16215.17999
26	2104.9824	38912.4151	606348.4916	14.91311	608.35100	15591.31935
27	2009.1084	36807.4327	567436.0765	15.00649	593.43789	14982.96835
28	1916.8285	34798.3243	530628.6438	16.03257	578.43140	14389.53046
29	1827.0718	32881.4958	495830.3195	17.26584	562.39883	13811.09906
30	1739.5339	31054.4240	462948.8237	16.89824	545.13299	13248.70023
31	1655.7305	29314.8901	431894.3997	16.24830	528.23475	12703.56724
32	1575.8003	27659.1596	402579.5096	15.34927	511.98645	12175.33249
33	1499.8433	26083.3593	374920.3500	14.49537	496.63718	11663.34604
34	1427.6617	24583.5160	348836.9907	13.93785	482.14181	11166.70886
35	1358.8137	23155.8543	324253.4747	13.40178	468.20396	10684.56705
36	1293.1499	21797.0406	301097.6204	13.12062	454.80218	10216.36309
37	1230.2927	20503.8907	279300.5798	12.84127	441.68156	9761.56091
38	1170.1325	19273.5980	258796.6891	12.56400	428.84029	9319.87935
39	1112.5634	18103.4655	239523.0911	12.70563	416.27629	8891.03906
40	1057.0669	16990.9021	221419.6256	13.21834	403.57066	8474.76277
41	1003.1921	15933.8352	204428.7235	13.28767	390.35232	8071.19211
42	951.32015	14930.6431	188494.8883	13.14694	377.06465	7680.83979
43	901.58398	13979.32295	173564.2452	12.64129	363.91771	7303.77514
44	854.26638	13077.73897	159584.92225	12.15508	351.27642	6939.85743
45	809.25489	12223.47259	146507.18328	11.52297	339.12134	6588.58101
46	766.60674	11414.21770	134283.71069	10.92150	327.59837	6249.45967
47	726.20037	10647.61096	122869.49299	10.19705	316.67687	5921.86130
48	688.07253	9921.41059	112221.88203	9.21949	306.47982	5605.18443
49	652.38871	9233.33806	102300.47144	8.583468	297.260326	5298.704615
50	618.71337	8580.94935	93067.13338	7.982736	288.676858	5001.444289
51	586.93396	7962.23598	84486.18403	8.065997	280.694122	4712.767431
52	556.29358	7375.30202	76523.94805	8.131046	272.628125	4432.073309

TABLE XIII.

COMMUTATION TABLES FOR SINGLE LIVES.

Age.	$l_x \times v^x =$	$\Sigma D_x =$	$\Sigma N_x =$	$d_x \times v^{x+1} =$	$\Sigma C_x =$	$\Sigma M_x =$
	D_x	N_x	S_x	C_x	M_x	R_x
53	526.76663	6819.00844	69148.64603	8.179158	264.497079	4159.445184
54	498.32722	6292.24181	62329.63759	8.095886	256.317921	3894.948105
55	471.06490	5793.91459	56037.39578	8.118128	248.222035	3638.630184
56	444.82889	5322.84969	50243.48119	8.126684	240.103907	3390.408149
57	419.59341	4878.02080	44920.63150	8.431022	231.977223	3150.304242
58	395.02418	4458.42739	40042.61070	9.194242	223.546201	2918.327019
59	370.63670	4063.40321	35584.18331	10.076402	214.351959	2694.780818
60	346.30504	3692.76651	31520.78010	11.151315	204.275557	2480.428859
61	321.83430	3346.46147	27828.01359	11.073974	193.124242	2276.153302
62	298.38208	3024.62717	24481.55212	10.732559	182.050268	2083.029060
63	276.17329	2726.24509	21456.92495	10.157254	171.317709	1900.978792
64	255.39398	2450.07180	18730.67986	9.766589	161.160455	1729.661083
65	235.80455	2194.67782	16280.60806	9.315824	151.393866	1568.500628
66	217.41932	1958.87327	14085.93024	8.885286	142.078042	1417.106762
67	200.17175	1741.45395	12127.05697	8.543544	133.192756	1275.028720
68	183.92929	1541.28220	10385.60302	8.214946	124.649212	1141.835964
69	168.64014	1357.35291	8844.32082	7.963205	116.434266	1017.186752
70	154.19078	1188.71277	7486.96791	7.656929	108.471061	900.752486
71	140.60344	1034.52199	6298.25514	7.956175	100.814132	792.281425
72	127.23943	893.91855	5263.73315	8.335260	92.857957	691.467293
73	114.01035	766.67912	4369.81460	8.563622	84.522697	598.609336
74	101.06172	652.66877	3603.13548	8.762090	75.959075	514.086639
75	88.412639	551.607051	2950.466713	8.120564	67.196985	438.127564
76	76.891589	463.194412	2398.859662	7.613030	59.076421	370.930579
77	66.321190	386.302823	1935.665250	6.850975	51.463391	311.854158
78	56.919401	319.081633	1549.362427	5.955800	44.12416	260.390767
79	48.774394	263.062232	1229.380794	5.553195	38.356616	215.778351
80	41.345262	214.287838	966.318562	4.839021	32.103421	177.121735
81	34.916038	172.942576	752.030724	4.492460	26.264400	144.018314
82	29.080654	138.026538	579.088148	3.933987	21.771940	115.753514
83	24.028180	108.945884	441.061610	3.486000	17.837953	91.981974
84	19.618019	84.917704	332.115726	2.995335	16.351953	72.144021
85	15.868145	65.299685	247.198022	2.674406	13.356618	55.792058
86	12.583425	49.431540	181.898337	2.340765	10.682212	42.435450
87	9.758682	36.848115	132.466797	2.028832	8.341447	31.753238
88	7.354516	27.089433	95.618682	1.554544	6.312615	23.411791
89	5.517106	19.734917	68.529248	1.143047	4.758071	17.099176
90	4.161863	14.217810	48.794332	1.042720	3.615024	12.341105
91	2.959071	10.055947	34.576521	.812932	2.572304	8.726081
92	2.032329	7.096876	24.520574	.547165	1.759372	6.153777
93	1.406997	5.064547	17.423698	.350747	1.212207	4.394405
94	1.002135	3.657550	12.359151	.240898	.861460	3.182198
95	.722693	2.655415	8.701601	.162143	.620562	2.320738
96	.532755	1.932722	6.046185	.111362	.458419	1.700177
97	.400002	1.399968	4.113463	.085663	.347057	1.241757
98	.299820	.999065	2.713495	.061776	.261394	.894700
99	.226512	.699245	1.714430	.039600	.199618	.633305
100	.178200	.472733	1.015185	.038077	.160018	.433687
101	.133269	.294532	.542452	.036612	.121941	.273669
102	.091531	.161263	.247920	.035204	.085329	.151727
103	.052806	.069732	.086657	.033850	.050124	.066399
104	.016925	.016925	.016925	.016274	.016274	.016274

TABLE XIV.

COMMUTATION TABLES FOR SINGLE LIVES.

AGE.	$l_x \times v^x =$	$\Sigma D_x =$	$\Sigma N_x =$	$d_x \times v^{x+1} =$	$\Sigma C_x =$	$\Sigma M_x =$
	D_x	N_x	S_x	C_x	M_x	R_x
0	10000.0000	130830.2193	2109618.7778	1465.714	3769.9893	30372.1816
1	8058.0952	120830.2193	1978788.5585	618.5941	2304.2753	26602.1923
2	7055.7823	112772.1241	1857958.3392	436.2380	1685.6812	24297.9170
3	6283.5547	105716.3418	1745186.2151	227.0659	1249.4432	22612.2358
4	5757.2719	99432.7871	1639469.8733	157.4888	1022.3773	21362.7926
5	5325.6273	93675.5152	1540037.0862	90.29206	864.88852	20340.41535
6	4981.7340	88349.8879	1446361.5710	58.27588	774.59646	19475.52683
7	4686.2327	83368.1539	1358011.6831	39.25668	710.32058	18700.93037
8	4423.8221	78681.9212	1274643.5292	27.71818	677.06390	17984.60979
9	4185.4457	74258.0991	1195961.6080	20.25914	649.34572	17307.54589
10	3965.8796	70072.6534	1121703.5089	16.95570	629.08658	16658.20017
11	3760.0725	66106.7738	1051630.8555	17.26196	612.13088	16029.11359
12	3563.7595	62346.7013	985524.0817	16.97029	594.86892	15416.98271
13	3377.0864	58782.9418	923177.3804	16.66724	577.89863	14822.11379
14	3199.6055	55405.8554	864394.4386	16.83560	561.23139	14244.21516
15	3030.4077	52206.2499	808988.5832	17.86635	544.39579	13682.98377
16	2868.2362	49175.8422	756782.3333	18.32446	526.52944	13138.58798
17	2713.3291	46307.6060	707606.4911	17.86739	508.20498	12612.05854
18	2566.2556	43594.2769	661298.8851	17.01656	490.33759	12103.85356
19	2427.0364	41028.0213	617704.6082	16.20625	473.32103	11613.51597
20	2295.2569	38600.9849	576676.5869	15.43452	457.11478	11140.19494
21	2170.3245	36305.7280	538075.6020	14.35770	441.68026	10683.08016
22	2052.8085	34135.2035	501769.8740	13.67399	427.32256	10241.39990
23	1941.3817	32082.3950	467634.6705	13.02285	413.64857	9814.07734
24	1835.9121	30141.0133	435552.2755	12.40272	400.62572	9400.42877
25	1736.0850	28305.1012	405411.2622	12.09335	388.22300	8999.80305
26	1641.3209	26569.0162	377106.1610	11.51748	376.12965	8611.58005
27	1551.6453	24927.6953	350537.1448	11.47921	364.61217	8235.45040
28	1466.2782	23376.0500	325609.4495	12.14732	353.13296	7870.83823
29	1384.3081	21909.7718	302233.3995	12.95713	340.98564	7517.70527
30	1305.4316	20525.4637	280323.6277	12.56049	328.02851	7176.71963
31	1230.7077	19220.0321	259798.1640	11.96237	315.46802	6848.69112
32	1160.1402	17989.3244	240578.1319	11.19286	303.50565	6533.22310
33	1093.7025	16829.1842	222588.8075	10.46951	292.31279	6229.71745
34	1031.1519	15735.4817	205759.6233	9.970965	281.843283	5937.404663
35	972.07851	14704.32982	190024.14156	9.496156	271.872318	5655.561380
36	916.29290	13732.25131	175319.81174	9.208394	262.376162	5383.689062
37	863.45150	12815.95841	161587.56043	8.926506	253.167768	5121.312900
38	813.40826	11952.50691	148771.60202	8.650582	244.241262	4868.145232
39	766.02395	11139.09865	136819.09511	8.664786	235.590680	4623.903870
40	720.88184	10373.07470	125679.99646	8.928584	226.925894	4388.313190
41	677.62554	9652.19286	115306.92176	8.889932	217.997310	4161.387296
42	636.46773	8974.56732	105654.72890	8.712010	209.107378	3943.889886
43	597.44773	8338.09959	96680.16158	8.297152	200.395368	3734.282608
44	560.70068	7740.65186	88342.06199	7.902050	192.098216	3533.887240
45	526.09860	7179.95118	80601.41013	7.419767	184.196166	3341.789024
46	493.62652	6653.85258	73421.45895	6.965495	176.776399	3157.592858
47	463.15499	6160.22606	66767.60637	6.441520	169.810904	2980.816459
48	434.65847	5697.07107	60607.38031	5.768525	163.369384	2811.005555
49	408.19192	5262.41260	54910.30924	5.319427	157.600859	2647.636171
50	383.43479	4854.22068	49647.89664	4.900018	152.281432	2490.035312
51	360.27597	4470.78589	44793.67596	4.903973	147.381414	2337.753880
52	338.21600	4110.50992	40322.89007	4.896440	142.477441	2190.372466

TABLE XIV.

COMMUTATION TABLES FOR SINGLE LIVES.

Age.	$l_x \times v^x =$	$\Sigma D_x =$	$\Sigma N_x =$	$d_x \times v^{x+1} =$	$\Sigma C_x =$	$\Sigma M_x =$
	D_x	N_x	S_x	C_x	M_x	R_x
53	317.21403	3772.29392	36212.38015	4.878506	137.581001	2047.895025
54	297.23010	3455.07989	32440.08623	4.782849	132.702495	1910.314024
55	278.29343	3157.84979	28985.00634	4.750313	127.919646	1777.611529
56	260.29106	2879.55636	25827.15655	4.710029	123.169333	1649.691883
57	243.18621	2619.26530	22947.60019	4.639880	118.459304	1526.522550
58	226.76604	2376.07909	20328.33489	5.227744	113.619424	1408.063246
59	210.73991	2149.31305	17952.25580	5.674767	108.391680	1294.443822
60	195.02991	1938.57314	15802.94275	6.220319	102.716913	1186.052142
61	179.52245	1743.54323	13864.36961	6.118346	96.496594	1083.335229
62	164.85542	1564.02078	12120.82638	5.873241	90.378248	986.838635
63	151.13192	1399.16536	10556.80560	5.505476	84.505007	896.460387
64	138.42969	1248.03344	9157.64024	5.243311	78.999531	811.955380
65	126.59449	1109.60375	7909.60680	4.953681	73.756220	732.955849
66	115.61250	983.00926	6800.00305	4.679744	68.802539	659.199629
67	105.42740	867.39676	5816.99379	4.456899	64.122795	590.397090
68	95.950148	761.969356	4949.597035	4.244666	59.665896	526.274295
69	87.136427	666.019208	4187.627679	4.075406	55.421230	466.608399
70	78.911667	578.882781	3521.608471	3.881338	51.345824	411.187169
71	71.272632	499.971112	2942.725690	3.994618	47.464486	359.841345
72	63.884079	428.698480	2442.754578	4.145091	43.469868	312.376859
73	56.696889	364.814401	2014.056098	4.218096	39.324777	268.906991
74	49.778941	308.117512	1649.241697	4.274750	35.106681	229.582214
75	43.133766	258.338571	1341.124185	3.924039	30.831931	194.475533
76	37.155738	215.204805	1082.785614	3.643750	26.907892	163.643602
77	31.742667	178.049067	867.580809	3.247787	23.264142	136.735710
78	26.983324	146.306400	689.531742	2.796529	20.016355	113.471568
79	22.901876	119.323076	543.225342	2.582653	17.219826	93.455213
80	19.228657	96.421200	423.902266	2.229075	14.637173	76.235387
81	16.083932	77.192543	327.481066	2.049725	12.408098	61.598214
82	13.268305	61.108611	250.288523	1.777822	10.358373	49.190116
83	10.858659	47.840306	189.179912	1.560367	8.580551	38.831743
84	8.781214	36.981647	141.339606	1.327972	7.020184	30.251192
85	7.035089	28.200433	104.357960	1.174397	5.692212	23.231008
86	5.525688	21.165344	76.157527	1.018098	4.517815	17.538796
87	4.244462	15.639656	54.992183	.874021	3.499717	13.020981
88	3.168324	11.395193	39.352527	.663319	2.625696	9.521264
89	2.354133	8.226869	27.957334	.483090	1.962377	6.895567
90	1.758941	5.872736	19.730465	.436491	1.479287	4.933190
91	1.218691	4.113795	13.857728	.337059	1.042796	3.453903
92	.842647	2.875104	9.743933	.224706	.705737	2.411106
93	.577815	2.032457	6.868829	.142670	.481031	1.705369
94	.407630	1.454641	4.836373	.097055	.338361	1.224338
95	.291164	1.047012	3.381731	.064703	.241306	.885977
96	.212596	.755847	2.334720	.044016	.176603	.644670
97	.158457	.543252	1.578872	.033536	.132587	.468067
98	.117375	.384795	1.035620	.023954	.099052	.335480
99	.087832	.267420	.650825	.015209	.075098	.236428
100	.068440	.179588	.383406	.014485	.059889	.161330
101	.050697	.111147	.203818	.013795	.045404	.101442
102	.034487	.060451	.092670	.013138	.031609	.056038
103	.019707	.025963	.032220	.012512	.018471	.024429
104	.006256	.006256	.006256	.005958	.005958	.005958

TABLE XV.

COMMUTATION TABLES FOR SINGLE LIVES.

Age.	$l_x \times v_x$	ΣD_x	ΣN_x	$d_x \times v^{x+1}$	ΣC_x	ΣM_x
	D_x	N_x	S_x	C_x	M_x	R_x
0	10000.0000	114397.1225	1630902.3139	1451.887	3524.6917	22081.8985
1	7982.0755	104397.1225	1516505.1914	606.9777	2072.8047	18557.2068
2	6923.2823	96415.0470	1412108.0689	424.0078	1465.8270	16484.4021
3	6107.3907	89491.7647	1315693.0219	218.6179	1041.8192	15018.5751
4	5543.0715	83384.3740	1226201.2572	150.1989	823.2013	13976.7559
5	5079.1138	77841.3025	1142816.8832	85.30024	673.00239	13153.55463
6	4706.3166	72762.1887	1064975.5807	54.53469	587.70215	12480.55224
7	4385.3866	68055.8721	992213.3920	36.38992	533.16746	11892.85009
8	4100.7673	63670.4855	924157.5199	25.45164	496.77754	11359.68263
9	3843.1967	59569.7182	860487.0344	18.42703	471.32590	10862.90509
10	3607.2303	55726.5215	800917.3162	15.27684	452.89887	10391.57919
11	3387.7706	52119.2912	745190.7947	15.40605	437.62203	9938.68032
12	3180.6039	48731.5206	693071.5035	15.00285	422.21598	9501.05829
13	2985.5669	45550.9167	644339.9829	14.59593	407.21313	9078.84231
14	2801.9766	42565.3498	598789.0662	14.60427	392.61720	8671.62918
15	2628.7699	39763.3732	556223.7164	15.35221	378.01293	8279.01198
16	2464.6194	37134.6033	516460.3432	15.59731	362.66072	7900.99905
17	2309.5153	34669.9839	479325.7399	15.06478	347.06341	7538.33833
18	2163.7233	32360.4686	444655.7560	14.21206	331.99803	7191.27492
19	2027.0363	30196.7453	412295.2874	13.40761	317.78657	6859.27629
20	1898.8908	28169.7090	382098.5421	12.64868	304.37896	6541.48972
21	1778.7577	26270.8182	353928.8331	11.65522	291.73028	6237.11076
22	1666.4181	24492.0605	327658.0149	10.99549	280.07506	5945.38048
23	1561.0971	22825.6424	303165.9544	10.37310	269.07957	5665.30542
24	1462.3600	21264.5453	280340.3120	9.785942	258.706472	5396.225852
25	1369.7989	19802.1853	259075.7667	9.451832	248.920530	5137.519380
26	1282.8113	18432.3864	239273.5814	8.916822	239.468698	4888.598850
27	1201.2825	17149.5751	220841.1950	8.803356	230.551876	4649.130152
28	1124.4821	15948.2926	203691.6199	9.227836	221.748520	4418.578276
29	1051.6043	14823.8105	187743.3273	9.750167	212.520684	4196.829756
30	982.32935	13772.2062	172919.51678	9.362528	202.770517	3984.309072
31	917.36328	12789.87685	159147.31058	8.832572	193.407989	3781.538555
32	856.60448	11872.51357	146357.43373	8.186426	184.575417	3588.130566
33	799.93101	11015.90909	134484.92016	7.585135	176.388991	3403.555149
34	747.06676	10215.97808	123469.01107	7.155786	168.803856	3227.166158
35	697.62418	9468.91132	113253.03299	6.750743	161.648070	3058.362302
36	651.38528	8771.28714	103784.12167	6.484417	154.897327	2896.714232
37	608.02999	8119.90186	95012.83453	6.226614	148.412910	2741.816905
38	567.38659	7511.87187	86892.93267	5.977220	142.186296	2593.403995
39	529.29315	6944.48528	79381.06080	5.930553	136.209076	2451.217699
40	493.40260	6415.19213	72436.57552	6.053456	130.278523	2315.008623
41	459.42070	5921.78953	66021.38339	5.970391	124.225067	2184.730100
42	427.44536	5462.36883	60099.59386	5.795703	118.254676	2060.505033
43	397.45464	5034.92347	54637.22503	5.467644	112.458973	1942.250357
44	369.48956	4637.46883	49602.30156	5.158155	106.991329	1829.793244
45	343.41690	4267.97927	44964.83273	4.797647	101.833174	1722.800055
46	319.18057	3924.56237	40696.85346	4.461423	97.035527	1620.966881
47	296.65232	3605.38180	36772.29109	4.086893	92.574104	1523.931354
48	275.77378	3308.72948	33166.90929	3.625377	88.487211	1431.357250
49	256.53857	3032.95570	29858.17981	3.311589	84.861834	1342.870039
50	238.70593	2776.41713	26825.22411	3.021711	81.550245	1258.008205
51	222.17256	2537.71120	24048.80698	2.995620	78.528534	1176.457960
52	206.60114	2315.53864	21511.09578	2.962801	75.532914	1097.929426

TABLE XV.

COMMUTATION TABLES FOR SINGLE LIVES.

Age.	$l_x \times v^x =$	$\Sigma D_x =$	$\Sigma N_x =$	$d_x \times v^{x+1} =$	$\Sigma C_x =$	$\Sigma M_x =$
	D_x	N_x	S_x	C_x	M_x	R_x
53	191.94393	2108.93750	19195.55714	2.924100	72.570113	1022.396512
54	178.15508	1916.99357	17086.61964	2.839719	69.646013	949.826399
55	165.23111	1738.83849	15169.62607	2.793794	66.806294	880.180386
56	153.08462	1573.60738	13430.78758	2.743969	64.012500	813.374092
57	141.67548	1420.52276	11857.18020	2.703018	61.268531	749.361592
58	130.86310	1278.84728	10436.65744	2.688387	58.475513	688.093061
59	120.46736	1147.98418	9157.81016	2.613320	55.487126	629.617548
60	110.43514	1027.51682	8009.82598	2.489008	52.273806	574.130422
61	100.69508	917.08168	6982.30916	2.399436	48.784798	521.856616
62	91.59525	816.386601	6065.227483	2.32468	45.385362	473.071818
63	83.178783	724.790676	5248.840882	2.261474	42.152894	427.686456
64	75.469075	641.611893	4524.050206	2.231580	39.151420	385.533562
65	68.365661	566.142818	3882.438313	2.1649931	36.319840	346.382142
66	61.845975	497.777157	3316.295495	2.1079774	33.669909	310.062302
67	55.865486	435.931182	2818.518338	2.059410	31.190135	276.392393
68	50.363880	380.065696	2382.587156	2.006991	28.850725	245.202258
69	45.306102	329.701816	2002.521460	2.098994	26.643734	216.351533
70	40.642613	284.395714	1672.819644	1.980183	24.544740	189.707799
71	36.361905	243.753101	1388.423930	2.018750	22.564557	165.163059
72	32.284934	207.391196	1144.670829	2.075031	20.545807	142.598502
73	28.382452	175.106262	937.279633	2.091658	18.470776	122.052695
74	24.684240	146.723810	762.173371	2.099753	16.379118	103.581919
75	21.187266	122.039570	615.449561	1.909300	14.279365	87.202801
76	18.078686	100.852304	493.409991	1.756196	12.370065	72.923436
77	15.299168	82.773618	392.557687	1.550584	10.613869	60.553371
78	12.882593	67.474450	309.784069	1.322545	9.063285	49.939502
79	10.830845	54.591857	242.309619	1.209876	7.740740	40.876217
80	9.007903	43.761012	187.717762	1.034387	6.530864	33.135477
81	7.463634	34.753109	143.956750	.942187	5.496477	26.604613
82	6.098978	27.289475	109.203640	.809494	4.554291	21.108136
83	4.944259	21.190497	81.914166	.703777	3.744797	16.553846
84	3.960618	16.246238	60.723669	.593309	3.041020	12.809049
85	3.143124	12.285620	44.477430	.519745	2.447711	9.768029
86	2.445466	9.142496	32.191810	.446322	1.927966	7.320318
87	1.860722	6.697030	23.049314	.379545	1.481644	5.392352
88	1.375852	4.836309	16.352283	.285331	1.102099	3.910707
89	1.012643	3.460456	11.515974	.205843	.816768	2.808609
90	.749481	2.447813	8.055518	.184233	.610925	1.991840
91	.522824	1.698332	5.607705	.140923	.426692	1.380915
92	.352307	1.175508	3.909372	.093062	.285769	.954223
93	.239303	.823201	2.733864	.058530	.192706	.668454
94	.167228	.583898	1.910663	.039440	.134177	.475747
95	.118321	.416670	1.326765	.026046	.094736	.341570
96	.085578	.298349	.910094	.017551	.068691	.246834
97	.063183	.212770	.611746	.013246	.051140	.178143
98	.046361	.149587	.398975	.009372	.037894	.127003
99	.034365	.103226	.249389	.005894	.028522	.089109
100	.026525	.068861	.146163	.003561	.022627	.060588
101	.019463	.042336	.077302	.00246	.017066	.037960
102	.013115	.022873	.034966	.001820	.011820	.020894
103	.007424	.009758	.012093	.001669	.006871	.009074
104	.002334	.002334	.002334	.002202	.002202	.002202

TABLE XVI.

PRESENT VALUE OF ANNUITIES OF £1 ON A SINGLE LIFE PAYABLE YEARLY,
FIRST PAYMENT DUE ONE YEAR HENCE, AT THE FOLLOWING RATES OF
INTEREST.

AGE.	a_x 3 per cent.	a_x 3½ per cent.	a_x 4 per cent.	a_x 5 per cent.	a_x 6 per cent.
0	17.31982	15.67193	14.28164	12.08302	10.43971
1	20.08429	18.17084	16.55456	13.99488	12.07894
2	21.50046	19.45564	17.72616	14.98293	12.92620
3	22.68295	20.53458	18.71508	15.82429	13.65303
4	23.28488	21.09151	19.23134	16.27082	14.04299
5	23.69267	21.47526	19.59203	16.58957	14.32576
6	23.84574	21.62976	19.74503	16.73477	14.46054
7	23.86655	21.66519	19.79018	16.79002	14.51879
8	23.80069	21.62246	19.76443	16.78596	14.52648
9	23.67706	21.52746	19.69113	16.74198	14.50005
10	23.51195	21.39473	19.58339	16.66888	14.44856
11	23.32653	21.24340	19.45857	16.58125	14.38454
12	23.14267	21.09341	19.33493	16.49464	14.32147
13	22.95675	20.94140	19.20938	16.40641	14.25704
14	22.76863	20.78725	19.08183	16.31647	14.19118
15	22.58198	20.63433	18.95534	16.22747	14.12623
16	22.40432	20.48956	18.83635	16.14498	14.06707
17	22.23229	20.34991	18.72211	16.06671	14.01180
18	22.05870	20.20881	18.60656	15.98750	13.95592
19	21.87976	20.06276	18.48649	15.90457	13.89699
20	21.69527	19.91158	18.36170	15.81772	13.83482
21	21.50503	19.75503	18.23196	15.72670	13.76920
22	21.30511	19.58946	18.09386	15.62854	13.69743
23	21.09882	19.41790	17.95015	15.52555	13.62154
24	20.88594	19.24008	17.80058	15.41746	13.54126
25	20.66620	19.05575	17.64486	15.30398	13.45627
26	20.44303	18.86802	17.48586	15.18758	13.36875
27	20.21262	18.67336	17.32028	15.06533	13.27606
28	19.98198	18.47823	17.15412	14.94244	13.18278
29	19.76205	18.29279	16.99682	14.82723	13.09638
30	19.55694	18.12096	16.85215	14.72312	13.01995
31	19.34924	17.94661	16.70511	14.61706	12.94199
32	19.13521	17.76627	16.55245	14.50616	12.85997
33	18.91097	17.57626	16.39072	14.38735	12.77108
34	18.67606	17.37614	16.21942	14.26010	12.67478
35	18.43366	17.16877	16.04123	14.12669	12.57309
36	18.18344	16.95384	15.85577	13.98675	12.46559
37	17.92868	16.73435	15.66587	13.84272	12.35445
38	17.66920	16.51013	15.47130	13.69436	12.23943
39	17.40480	16.28096	15.27185	13.54145	12.12030
40	17.14242	16.05334	15.07364	13.38943	12.00194
41	16.88934	15.83413	14.88313	13.24414	11.88969
42	16.63900	15.61723	14.69465	13.10059	11.77910
43	16.38808	15.39953	14.50529	12.95620	11.66792
44	16.12951	15.17437	14.30873	12.80532	11.55101
45	15.86292	14.94137	14.10461	12.64754	11.42798
46	15.58441	14.69677	13.88927	12.47953	11.29574
47	15.29335	14.43992	13.66208	12.30057	11.15356
48	14.98559	14.16680	13.41913	12.10701	10.99799
49	14.65328	13.86985	13.15312	11.89201	10.82261
50	14.30226	13.55445	12.86902	11.65983	10.63112
51	13.93170	13.21966	12.56581	11.40934	10.42226

$$\frac{N_x + 1}{D_x} = a_x$$

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TABLE XVI.

PRESENT VALUE OF ANNUITIES OF \$1 ON A SINGLE LIFE PAYABLE YEARLY,
FIRST PAYMENT DUE ONE YEAR HENCE, AT THE FOLLOWING RATES OF
INTEREST.

AGE.	a_x 3 per cent.	a_x 3½ per cent.	a_x 4 per cent.	a_x 5 per cent.	a_x 6 per cent.
52	13.55770	12.88073	12.25793	11.15351	10.20777
53	13.17999	12.53734	11.94503	10.89196	9.987262
54	12.79820	12.18913	11.62673	10.62426	9.760249
55	12.40871	11.83257	11.29961	10.34720	9.523672
56	12.01422	11.47021	10.96606	10.06283	9.279332
57	11.61432	11.10160	10.62559	9.770612	9.026594
58	11.21806	10.73539	10.28647	9.478104	8.772404
59	10.84124	10.38676	9.963307	9.198890	8.529424
60	10.49139	10.06310	9.663330	8.939874	8.304256
61	10.18055	9.776184	9.398086	8.712118	8.107514
62	9.875137	9.493876	9.136756	8.487224	7.912912
63	9.566672	9.208026	8.871502	8.257904	7.713650
64	9.245560	8.909336	8.593304	8.015649	7.501652
65	8.917348	8.603084	8.307190	7.765024	7.281100
66	8.578414	8.285716	8.009655	7.502620	7.048660
67	8.227974	7.956377	7.699800	7.227432	6.803232
68	7.868467	7.617360	7.379753	6.941305	6.546395
69	7.499315	7.268015	7.048815	6.643406	6.277206
70	7.123216	6.910895	6.709363	6.335831	5.997475
71	6.736465	6.542297	6.357729	6.014911	5.703530
72	6.372421	6.194681	6.025481	5.710568	5.423776
73	6.043458	5.880237	5.724647	5.434469	5.169526
74	5.752223	5.601755	5.458121	5.189716	4.944028
75	5.511965	5.372406	5.239007	4.989241	4.760043
76	5.276908	5.147682	5.023995	4.791968	4.578520
77	5.059126	4.939437	4.824726	4.609138	4.410334
78	4.838099	4.727650	4.621661	4.422104	4.237645
79	4.591741	4.490610	4.393448	4.210188	4.040406
80	4.364724	4.272038	4.182888	4.014452	3.858069
81	4.118720	4.034344	3.953097	3.799358	3.656324
82	3.897641	3.820596	3.746335	3.605608	3.474436
83	3.671854	3.601736	3.534089	3.405729	3.285880
84	3.454046	3.390201	3.328555	3.211450	3.101945
85	3.229227	3.171204	3.115142	3.008539	2.908729
86	3.033015	2.979775	2.928305	2.830355	2.738549
87	2.873345	2.823826	2.775931	2.684719	2.599157
88	2.775972	2.728911	2.683374	2.596599	2.515136
89	2.664895	2.620254	2.577041	2.494649	2.417250
90	2.498709	2.456798	2.416214	2.338790	2.266012
91	2.480582	2.438815	2.398347	2.321082	2.248382
92	2.576998	2.533843	2.491991	2.411991	2.336600
93	2.686541	2.642399	2.599544	2.517485	2.439994
94	2.735634	2.692093	2.649759	2.568537	2.491631
95	2.756938	2.715089	2.674331	2.595950	2.521506
96	2.703887	2.665371	2.627791	2.555324	2.486257
97	2.558615	2.524951	2.492042	2.423393	2.367497
98	2.388335	2.359990	2.332216	2.278331	2.226561
99	2.130891	2.108749	2.087005	2.044677	2.003833
100	1.682557	1.667568	1.652816	1.624003	1.596078
101	1.228185	1.219056	1.210052	1.192404	1.175227
102	.771043	.766412	.761834	.752834	.744037
103	.323624	.322061	.320513	.317460	.314466

$$\frac{N_x + 1}{D_x} = a_x$$

TABLE XVII.

PRESENT VALUE OF INCREASING ANNUITIES OF £1 PER ANNUM, THE FIRST PAYMENT OF £1 BEING DUE ONE YEAR HENCE, AND THE INCREASE £1 YEARLY.

AGE.	$I a_x$ 3 per cent.	$I a_x$ 3½ per cent.	$I a_x$ 4 per cent.	$I a_x$ 5 per cent.	$I a_x$ 6 per cent.
0	370.2050	312.4763	266.1124	197.8789	151.6505
1	429.5847	363.0686	309.5425	230.5704	176.9099
2	458.7642	388.2655	331.4218	247.3412	190.0389
3	481.6497	408.2191	348.8930	260.9144	200.7733
4	491.3803	417.0789	356.9280	267.4942	206.1704
5	496.3959	421.9669	361.5905	271.5852	209.6775
6	495.7091	422.0217	362.1249	272.5983	210.8259
7	492.0632	419.5590	360.5031	271.9976	210.7357
8	486.5219	415.4746	357.4857	270.3459	209.8356
9	479.7591	410.3363	353.5563	268.0011	208.3988
10	472.1641	404.4731	348.9936	265.1697	206.5826
11	464.1958	398.2738	344.1313	262.1024	204.5804
12	456.2947	392.1168	339.2952	259.0459	202.5841
13	448.3886	385.9387	334.4308	255.9586	200.5612
14	440.4773	379.7404	329.5379	252.8401	198.5112
15	432.6303	373.5804	324.6681	249.7296	196.4647
16	424.9806	367.5745	319.9217	246.7044	194.4826
17	417.4539	361.6589	315.2436	243.7223	192.5321
18	409.9126	355.7145	310.5294	240.7027	190.5490
19	402.2903	349.6830	305.7283	237.6052	188.5010
20	394.5894	343.5660	300.8409	234.4293	186.3871
21	386.8121	337.3641	295.8674	231.1745	184.2061
22	378.8980	331.0246	290.7603	227.8024	181.9268
23	370.9151	324.6057	285.5705	224.3517	179.5790
24	362.8666	318.1100	280.2993	220.8229	177.1628
25	354.7563	311.5401	274.9492	217.2164	174.6779
26	346.6482	304.9520	269.5681	213.5701	172.1541
27	338.4855	298.2947	264.1115	209.8478	169.5618
28	330.3875	291.6737	258.6722	206.1229	166.9598
29	322.5232	285.2386	253.3829	202.5009	164.4340
30	314.9391	279.0313	248.2816	199.0133	162.0101
31	307.3488	272.7981	243.1431	195.4795	159.5414
32	299.6983	266.4912	237.9237	191.8637	156.9977
33	291.9373	260.0647	232.5823	188.1313	154.3496
34	284.0723	253.5238	227.1221	184.2833	151.5969
35	276.1622	246.9199	221.5886	180.3556	148.7679
36	268.2114	240.2567	215.9847	176.3493	145.8627
37	260.2753	233.5833	210.3538	172.2987	142.9090
38	252.3564	226.9018	204.6975	168.2047	139.9065
39	244.4576	220.2144	199.0175	164.0680	136.8553
40	236.6753	213.6081	193.3924	159.9526	133.8083
41	229.0984	207.1634	187.8951	155.9190	130.8161
42	221.6283	200.7917	182.4456	151.9011	127.8227
43	214.2177	194.4503	177.0050	147.8657	124.7999
44	206.7799	188.0599	171.5006	143.7512	121.6945
45	199.3194	181.6240	165.9350	139.5584	118.5057
46	191.8004	175.1098	160.2771	135.2594	115.2085
47	184.2321	168.5243	154.5330	130.8577	111.8040
48	176.5857	161.8408	148.6769	126.3298	108.2706
49	168.8004	155.0025	142.6559	121.6288	104.5660
50	160.9741	148.0987	136.5514	116.8222	100.7466
51	153.1267	141.1474	130.3792	111.9223	96.8216

$$\frac{S_{r+1}}{D_r} = I a_x$$

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TABLE XVII.

PRESENT VALUE OF INCREASING ANNUITIES OF £1 PER ANNUM, THE FIRST PAYMENT OF £1 BEING DUE ONE YEAR HENCE, AND THE INCREASE £1 YEARLY.

AGE.	$I a_x$ 3 per cent.	$I a_x$ 3½ per cent.	$I a_x$ 4 per cent.	$I a_x$ 5 per cent.	$I a_x$ 6 per cent.
52	145.4496	134.3250	124.3024	107.0688	92.91122
53	137.9457	127.6350	118.3250	102.2656	89.01882
54	130.6178	121.0813	112.4510	97.51707	85.14848
55	123.4399	114.6403	106.6594	92.80548	81.28488
56	116.4492	108.3479	100.9840	88.16128	77.45507
57	109.6514	102.2105	95.43192	83.59162	73.66597
58	103.1334	96.31027	90.08102	79.16640	69.98010
59	97.02134	90.76712	85.04496	74.98789	66.48961
60	91.34830	85.61436	80.35694	71.08842	63.22543
61	86.16830	80.90497	76.06882	67.51708	60.23360
62	81.17214	76.35052	71.91088	64.03676	57.30430
63	76.28975	71.88573	67.82222	60.59368	54.38947
64	71.45802	67.45140	63.74704	57.13808	51.44410
65	66.73288	63.10061	59.73563	53.71484	48.50820
66	62.10154	58.82177	55.77729	50.31458	45.57317
67	57.57591	54.62654	51.88344	46.94791	42.64865
68	53.18936	50.54730	48.08544	43.64379	39.76105
69	48.95442	46.59691	44.39612	40.41487	36.92262
70	44.90396	42.80767	40.84715	37.29139	34.16178
71	41.03333	39.17645	37.43673	34.27339	31.47996
72	37.53469	35.88835	34.34325	31.52673	29.03149
73	34.44375	32.97981	31.60357	29.08875	26.85369
74	31.73103	30.42476	29.19470	26.94159	24.93290
75	29.41003	28.23799	27.13254	25.10298	23.28804
76	27.21462	26.16525	25.17395	23.34984	21.71384
77	25.18961	24.25022	23.36150	21.72254	20.24842
78	23.23006	22.39233	21.59862	20.13189	18.80907
79	21.25691	20.51545	19.81201	18.50950	17.33178
80	19.47063	18.81337	18.18904	17.03089	15.98116
81	17.71541	17.13610	16.58516	15.56140	14.63142
82	16.16807	15.65516	15.16684	14.25803	13.43081
83	14.70777	14.25419	13.82193	13.01630	12.28165
84	13.38683	12.98441	12.60056	11.88424	11.22992
85	12.16197	11.80444	11.46311	10.82538	10.24198
86	11.15619	10.83448	10.52708	9.952095	9.425322
87	10.37379	10.07962	9.79832	9.271498	8.788138
88	9.856622	9.581407	9.317982	8.824012	8.370060
89	9.348024	9.090720	8.844188	8.381200	7.954937
90	8.774192	8.536234	8.307940	7.878449	7.482122
91	8.741446	8.509470	8.286578	7.866312	7.477414
92	9.028168	8.796340	8.573266	8.151490	7.759882
93	9.228762	9.002394	8.784062	8.370104	7.984282
94	9.096954	8.886506	8.683064	8.296088	7.933874
95	8.736214	8.548286	8.366184	8.018570	7.691699
96	8.033032	7.874820	7.721122	7.426630	7.148357
97	7.013742	6.889495	6.768469	6.535666	6.314550
98	5.899864	5.807963	5.718198	5.544825	5.379269
99	4.603291	4.541920	4.481805	4.365224	4.253291
100	3.112477	3.077961	3.044057	2.978034	2.914297
101	1.893625	1.876830	1.860289	1.827942	1.796545
102	.959562	.953114	.946746	.934240	.922036
103	.323624	.322061	.320513	.317460	.314466

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$$\frac{s_x + 1}{D_x} = I a_x$$

TABLE XVIII.

PRESENT VALUES OF AN ASSURANCE OF £1 ON A SINGLE LIFE, PAYABLE AT THE END OF THE YEAR IN WHICH THE LIFE FAILS, AT THE FOLLOWING RATES OF INTEREST.

AGE. (x)	A_x 3 per cent.	A_x $3\frac{1}{2}$ per cent.	A_x 4 per cent.	A_x 5 per cent.	A_x 6 per cent.
0	.4664130	.4362150	.4122445	.3769989	.3524692
1	.3858946	.3517107	.3248248	.2859578	.2596825
2	.3446463	.3082631	.2797630	.2389078	.2117242
3	.3102055	.2717772	.2417277	.1988433	.1705833
4	.2926734	.2529437	.2218721	.1775801	.1485100
5	.2807963	.2399665	.2079986	.1624013	.1325039
6	.2763374	.2347425	.2021146	.1554874	.1248752
7	.2757315	.2335443	.2003777	.1528564	.1215783
8	.2776498	.2349893	.2013681	.1530496	.1211426
9	.2812506	.2382021	.2041872	.1551437	.1226390
10	.2860597	.2426902	.2083311	.1586247	.1255531
11	.2914607	.2478075	.2131320	.1627976	.1291770
12	.2968148	.2528794	.2178872	.1669217	.1327471
13	.3022303	.2580202	.2227162	.1711234	.1363938
14	.3077096	.2632329	.2276224	.1754065	.1401215
15	.3131464	.2684042	.2324869	.1796444	.1437984
16	.3183209	.2732998	.2370634	.1835725	.1471467
17	.3233312	.2780221	.2414574	.1872994	.1502754
18	.3283874	.2827940	.2459016	.1910712	.1534386
19	.3335994	.2877326	.2505195	.1950201	.1567740
20	.3389726	.2928452	.2553192	.1991563	.1602931
21	.3445135	.2981391	.2603091	.2034901	.1640079
22	.3503368	.3037381	.2656208	.2081649	.1680702
23	.3563451	.3095396	.2711479	.2130691	.1723657
24	.3625452	.3155527	.2769006	.2182162	.1769102
25	.3689454	.3217861	.2828899	.2236198	.1817205
26	.3754457	.3281346	.2890052	.2291627	.1866749
27	.3821568	.3347175	.2953738	.2349843	.1919215
28	.3889743	.3413158	.3017648	.2408363	.1972006
29	.39592803	.3475868	.3078144	.2463221	.2020919
30	.4012541	.3533975	.3133788	.2512798	.2064180
31	.4073039	.3592935	.3190343	.2563306	.2108303
32	.4135377	.3653921	.3249057	.2616112	.2154733
33	.4200688	.3718171	.3311261	.2672691	.2205053
34	.4269108	.3785848	.3377143	.2733286	.2259555
35	.4339711	.3855971	.3445682	.2796815	.2317123
36	.4412589	.3928653	.3517011	.2863453	.2377967
37	.4486792	.4002874	.3590053	.2932045	.2440881
38	.4562369	.4078699	.3664888	.3002691	.2505987
39	.4639380	.4156197	.3741595	.3075501	.2573415
40	.4715802	.4233172	.3817835	.3147894	.2640410
41	.4789513	.4307299	.3891102	.3217076	.2703951
42	.4862427	.4380648	.3963595	.3285436	.2766545
43	.4935510	.4454263	.4036425	.3354192	.2829480
44	.5010825	.4530405	.4112025	.3426039	.2895652
45	.5088467	.4609195	.4190539	.3501173	.2965293
46	.5169591	.4691914	.4273356	.3581178	.3040146
47	.5254366	.4778770	.4360736	.3666396	.3120627
48	.5344005	.4871129	.4454178	.3758569	.3208689
49	.5440790	.4971547	.4556490	.3860951	.3307956
50	.5543026	.5078206	.4665761	.3971507	.3416348
51	.5650965	.5191419	.4782380	.4090794	.3534574
52	.5759891	.5306031	.4900794	.4212617	.3655978

$M_x = A_x$
 $D_x =$

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TABLE XVIII.

PRESENT VALUES OF AN ASSURANCE OF £1 ON A SINGLE LIFE, PAYABLE AT THE END OF THE YEAR IN WHICH THE LIFE FAILS, AT THE FOLLOWING RATES OF INTEREST.

AGE. (x)	A_x 3 per cent.	A_x 3½ per cent.	A_x 4 per cent.	A_x 5 per cent.	A_x 6 per cent.
53	.5869908	.5422155	.5021146	.4337168	.3780798
54	.5981106	.5539908	.5143566	.4464637	.3909292
55	.6094552	.5660483	.5269381	.4596572	.4043204
56	.6209451	.5783021	.5397669	.4731983	.4181512
57	.6325926	.5907673	.5528618	.4871134	.4324569
58	.6441339	.6031511	.5659050	.5010423	.4468450
59	.6551098	.6149404	.5783345	.5143387	.4605989
60	.6652993	.6258854	.5898719	.5266725	.4733439
61	.6743528	.6355880	.6000734	.5375182	.4844804
62	.6832485	.6451346	.6101247	.5482272	.4954953
63	.6922332	.6548011	.6203270	.5591473	.5067746
64	.7015856	.6649016	.6310270	.5706834	.5187744
65	.7111452	.6752582	.6420314	.5826180	.5312585
66	.7210172	.6859905	.6534746	.5951134	.5444155
67	.7312242	.6971273	.6653925	.6082174	.5583078
68	.7416952	.7085915	.6777018	.6218426	.5728455
69	.7524470	.7204053	.6904303	.6360283	.5880825
70	.7634010	.7324818	.7034862	.6506744	.6039164
71	.7746662	.7449462	.7170102	.6659568	.6205549
72	.7852690	.7567014	.7297890	.6804490	.6363901
73	.7948507	.7673345	.7413598	.6935966	.6507817
74	.8033330	.7767524	.7516107	.7052515	.6635456
75	.8103310	.7845080	.7600382	.7147980	.6739595
76	.8171776	.7921074	.7683079	.7241920	.6842345
77	.8235206	.7991494	.7759720	.7328980	.6937546
78	.8299582	.8063116	.7837824	.7418043	.7035295
79	.8371338	.8143272	.7925596	.7518960	.7146940
80	.8437460	.8217186	.8006582	.7612165	.7250150
81	.8509110	.8297564	.8094962	.7714594	.7364342
82	.8573500	.8369846	.8174486	.7806850	.7467304
83	.8639268	.8443860	.8256120	.7902035	.7574030
84	.8702706	.8515390	.8335168	.7994547	.7678145
85	.8768188	.8589448	.8417252	.8091174	.7787510
86	.8825332	.8654184	.8489112	.8176022	.7883837
87	.8871838	.8706918	.8547718	.8245372	.7962739
88	.8900200	.8739018	.8583318	.8287332	.8010297
89	.8932556	.8775756	.8624214	.8335879	.8065704
90	.8980958	.8831036	.8686072	.8410098	.8151314
91	.8986238	.8837114	.8692944	.8418529	.8161290
92	.8958152	.8804980	.8656924	.8375240	.8111354
93	.8926250	.8768268	.8615562	.8325006	.8052832
94	.8911950	.8751464	.8596246	.8300694	.8023602
95	.8905742	.8743692	.8586794	.8287636	.8006692
96	.8921204	.8760506	.8604700	.8306986	.8026654
97	.8963510	.8807990	.8656906	.8367430	.8093872
98	.9013106	.8863778	.8718378	.8438888	.8173652
99	.9088088	.8948734	.8812690	.8550154	.8299720
100	.9218672	.9097928	.8979686	.8750474	.8530506
101	.9351012	.9249598	.9149982	.8956004	.8768722
102	.9484160	.9402672	.9322370	.9165326	.9012816
103	.9614477	.9552934	.9492109	.9372646	.9255964
104	.9708738	.9661836	.9615385	.9523809	.9433962

$$\begin{aligned} M_x &= A_x \\ D_x &= A_x \end{aligned}$$

TABLE XIX.

VALUE OF INCREASING ASSURANCE OF \$1 PER ANNUM ON A SINGLE LIFE,
PAYABLE AT THE END OF THE YEAR IN WHICH THE LIFE FAILS.

AGE. (x)	$I A_x$ Increasing Assur- ance, 3 per cent.	$I A_x$ Increasing Assur- ance, 3½ per cent.	$I A_x$ Increasing Assur- ance, 4 per cent.	$I A_x$ Increasing Assur- ance, 5 per cent.	$I A_x$ Increasing Assur- ance, 6 per cent.
0	7.003566	5.541313	4.458797	3.037218	2.208190
1	7.958007	6.244860	4.973898	3.301300	2.324861
2	8.483050	6.634156	5.258932	3.443689	2.381009
3	8.964518	7.001848	5.537844	3.598638	2.459083
4	9.265509	7.240348	5.725194	3.710575	2.521484
5	9.515324	7.445822	5.892708	3.819347	2.589733
6	9.683954	7.593240	6.019253	3.909389	2.651872
7	9.810347	7.710755	6.125056	3.990611	2.711927
8	9.907804	7.807585	6.216343	4.065401	2.770136
9	9.984747	7.889542	6.297004	4.135176	2.826530
10	10.045655	7.959590	6.368899	4.200381	2.880764
11	10.097712	8.023007	6.435880	4.262979	2.933693
12	10.149368	8.086314	6.503003	4.326045	2.987187
13	10.199121	8.148344	6.569368	4.389022	3.040910
14	10.246900	8.209026	6.634906	4.451868	3.094826
15	10.294240	8.269582	6.700591	4.515227	3.149387
16	10.344564	8.332804	6.768732	4.580722	3.205769
17	10.396774	8.397920	6.838810	4.648188	3.264034
18	10.447884	8.462612	6.909018	4.716541	3.323565
19	10.496165	8.525464	6.978225	4.785061	3.383894
20	10.541346	8.586254	7.046216	4.853570	3.444900
21	10.583171	8.644716	7.112755	4.921889	3.506442
22	10.619576	8.699130	7.176392	4.988971	3.567760
23	10.651820	8.750436	7.237822	5.055203	3.629053
24	10.679556	8.798294	7.296735	5.120303	3.690080
25	10.702442	8.842358	7.352783	5.183965	3.750564
26	10.721922	8.883770	7.406865	5.246737	3.810847
27	10.735974	8.920814	7.457522	5.307561	3.870139
28	10.747917	8.956182	7.506947	5.367902	3.929435
29	10.763447	8.994622	7.559145	5.430660	3.990885
30	10.785207	9.038516	7.616237	5.497585	4.055981
31	10.804632	9.080842	7.672485	5.564840	4.122182
32	10.819672	9.119884	7.726445	5.631409	4.188784
33	10.828010	9.153620	7.776380	5.695988	4.254811
34	10.829020	9.181450	7.821677	5.758031	4.319783
35	10.824077	9.204420	7.863160	5.818009	4.383969
36	10.812715	9.222078	7.900367	5.875513	4.447005
37	10.796525	9.235696	7.934340	5.931213	4.509345
38	10.775250	9.244998	7.964807	5.984874	4.570789
39	10.748610	9.249720	7.991489	6.036240	4.631115
40	10.720542	9.253194	8.017246	6.087426	4.691928
41	10.695520	9.259336	8.045512	6.141131	4.755402
42	10.670047	9.265234	8.073876	6.195743	4.820511
43	10.642273	9.269348	8.101047	6.250393	4.886720
44	10.607873	9.267904	8.123762	6.302629	4.952212
45	10.566358	9.260416	8.141540	6.352021	5.016643
46	10.514944	9.244376	8.152108	6.396724	5.078527
47	10.452799	9.218908	8.154582	6.435894	5.137096
48	10.376714	9.181040	8.146212	6.467160	5.190331
49	10.280850	9.125372	8.122004	6.486253	5.234574
50	10.168000	9.054100	8.083620	6.494026	5.270116
51	10.036790	8.965702	8.029467	6.488787	5.295244
52	9.897297	8.868944	7.967147	6.476251	5.314245

$$\frac{R_x}{D_x} = I A_x$$

TABLE XIX.

VALUE OF INCREASING ASSURANCE OF \$1 PER ANNUM ON A SINGLE LIFE,
PAYABLE AT THE END OF THE YEAR IN WHICH THE LIFE FAILS.

AGE. (x)	$I A_x$ Increasing Assur- ance, 3 per cent.	$I A_x$ Increasing Assur- ance, $3\frac{1}{2}$ per cent.	$I A_x$ Increasing Assur- ance, 4 per cent.	$I A_x$ Increasing Assur- ance, 5 per cent.	$I A_x$ Increasing Assur- ance, 6 per cent.
53	9.749144	8.763400	7.896184	6.455879	5.326541
54	9.591909	8.648584	7.816045	6.427054	5.331459
55	9.422822	8.521890	7.724265	6.387546	5.326966
56	9.243438	8.384572	7.621825	6.337874	5.313232
57	9.053174	8.235976	7.507992	6.277177	5.289281
58	8.858310	8.081670	7.387715	6.209320	5.258115
59	8.670488	7.932277	7.270682	6.142376	5.226458
60	8.496056	7.793807	7.162555	6.081383	5.198801
61	8.345150	7.675855	7.072438	6.034536	5.182544
62	8.194149	7.557110	6.981080	5.986084	5.164768
63	8.036870	7.431909	6.883285	5.931641	5.141773
64	7.865844	7.293270	6.772520	5.865471	5.108498
65	7.684815	7.144508	6.651700	5.789791	5.066609
66	7.490650	6.982562	6.517851	5.701801	5.013459
67	7.282230	6.806232	6.369674	5.600035	4.947462
68	7.060956	6.616618	6.208016	5.484871	4.868613
69	6.825905	6.412679	6.031703	5.354916	4.775328
70	6.578735	6.195773	5.841805	5.210726	4.667706
71	6.315987	5.962434	5.634867	5.048800	4.542202
72	6.064448	5.737768	5.434377	4.889743	4.416874
73	5.835089	5.532310	5.250482	4.742887	4.300287
74	5.631351	5.349651	5.086857	4.612035	4.196277
75	5.465694	5.202007	4.955486	4.508660	4.115811
76	5.301429	5.054975	4.824073	4.404263	4.033669
77	5.148968	4.918527	4.702179	4.307630	3.957951
78	4.991452	4.776732	4.574728	4.205249	3.876510
79	4.809741	4.611178	4.424010	4.080677	3.774056
80	4.641365	4.457556	4.283966	3.964675	3.678489
81	4.453648	4.284618	4.124703	3.829797	3.564565
82	4.284076	4.128180	3.980444	3.707340	3.460931
83	4.107399	3.964095	3.828087	3.576108	3.348095
84	3.934409	3.802651	3.677436	3.444989	3.234104
85	3.751815	3.630966	3.515978	3.302163	3.107746
86	3.590612	3.478809	3.372329	3.174048	2.993424
87	3.458380	3.353661	3.253845	3.067757	2.897990
88	3.378906	3.278804	3.183322	3.005141	2.842389
89	3.285880	3.190414	3.099301	2.929133	2.773542
90	3.141246	3.051238	2.965283	2.804635	2.657627
91	3.124600	3.034766	2.948926	2.788349	2.641262
92	3.209858	3.116879	3.027943	2.861347	2.708497
93	3.310365	3.214797	3.123251	2.951409	2.793336
94	3.361870	3.266730	3.175420	3.003553	2.844906
95	3.393058	3.300385	3.211234	3.042877	2.886797
96	3.362035	3.275123	3.191296	3.032373	2.884299
97	3.250682	3.172772	3.097406	2.953913	2.819456
98	3.117806	3.049965	2.984123	2.858180	2.739438
99	2.905625	2.850031	2.795896	2.691826	2.593051
100	2.513770	2.473276	2.433705	2.357240	2.284166
101	2.108133	2.080549	2.053499	2.000961	1.950407
102	1.691511	1.674449	1.657658	1.624879	1.593125
103	1.275646	1.266464	1.257396	1.239607	1.222256
104	.970874	.966184	.961539	.952381	.943396

$$\frac{R_x}{D_x} = I A_x$$

TABLE XX.

ANNUAL PREMIUM FOR ASSURANCE OF \$1 ON A SINGLE LIFE, PAYABLE
AT THE END OF THE YEAR IN WHICH THE LIFE FAILS.

AGE. (x)	Annual Premium, 3 per cent.	Annual Premium, 3½ per cent.	Annual Premium, 4 per cent.	Annual Premium, 5 per cent.	Annual Premium, 6 per cent.
0	.0254595	.0261646	.0269765	.0288159	.0308110
1	.0183025	.0183461	.0185037	.0190704	.0198550
2	.0153173	.0150698	.0149397	.0149477	.0152033
3	.0130983	.0126205	.0122611	.0118188	.0116415
4	.0120517	.0114498	.0109668	.0102821	.0098724
5	.0113716	.0106769	.0101009	.0092328	.0086458
6	.0111221	.0103732	.0097428	.0087674	.0080770
7	.0110885	.0103041	.0096381	.0085923	.0078343
8	.0111952	.0103874	.0096977	.0086051	.0078023
9	.0113973	.0105739	.0098683	.0087444	.0079122
10	.0116702	.0108369	.0101213	.0089776	.0081272
11	.0119812	.0111407	.0104177	.0092597	.0083965
12	.0122942	.0114459	.0107149	.0095413	.0086641
13	.0126157	.0117595	.0110204	.0098311	.0089397
14	.0129460	.0120820	.0113347	.0101295	.0092239
15	.0132790	.0124064	.0116504	.0104278	.0095066
16	.0136009	.0127178	.0119510	.0107071	.0097661
17	.0139173	.0130222	.0122430	.0109745	.0100105
18	.0142414	.0133338	.0125418	.0112478	.0102594
19	.0145805	.0136607	.0128561	.0115365	.0105239
20	.0149358	.0140040	.0131868	.0118420	.0108052
21	.0153083	.0143647	.0135352	.0121656	.0111047
22	.0157066	.0147521	.0139113	.0125185	.0114353
23	.0161251	.0151602	.0143085	.0128933	.0117885
24	.0165652	.0155905	.0147283	.0132917	.0121661
25	.0170286	.0160446	.0151725	.0137157	.0125703
26	.0175090	.0165157	.0156339	.0141567	.0129917
27	.0180155	.0170137	.0161228	.0146268	.0134436
28	.0185337	.0175229	.0166224	.0151066	.0139042
29	.0190386	.0180164	.0171038	.0155632	.0143364
30	.0195192	.0184822	.0175541	.0159815	.0147232
31	.0200157	.0189635	.0180193	.0164135	.0151220
32	.0205380	.0194707	.0185106	.0168714	.0155464
33	.0210974	.0200157	.0190404	.0173694	.0160122
34	.0216970	.0206020	.0196124	.0179113	.0165235
35	.0223309	.0212231	.0202197	.0184893	.0170715
36	.0230021	.0218820	.0208653	.0191066	.0176596
37	.0237037	.0225713	.0215414	.0197546	.0182777
38	.0244379	.0232934	.0222501	.0204343	.0189282
39	.0252074	.0240507	.0229943	.0211499	.0196140
40	.0259932	.0248231	.0237522	.0218764	.0203078
41	.0267730	.0255867	.0244983	.0225853	.0209776
42	.0275663	.0263621	.0252544	.0233000	.0216490
43	.0283845	.0271609	.0260326	.0240337	.0223358
44	.0292526	.0280098	.0268606	.0248168	.0230711
45	.0301755	.0289134	.0277435	.0256542	.0238598
46	.0311714	.0298910	.0287009	.0265675	.0247252
47	.0322485	.0309507	.0297416	.0275657	.0256766
48	.0334301	.0321170	.0308907	.0286760	.0267436
49	.0347581	.0334337	.0321942	.0299484	.0279799
50	.0362236	.0348911	.0336416	.0313709	.0293725
51	.0378454	.0365087	.0352532	.0329654	.0309446
52	.0395659	.0382259	.0369650	.0346617	.0326200

$$\frac{M_x}{N_x} = \text{ANNUAL PREMIUM FOR } A_x$$

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TABLE XX.

ANNUAL PREMIUM FOR ASSURANCE OF \$1 ON A SINGLE LIFE, PAYABLE
AT THE END OF THE YEAR IN WHICH THE LIFE FAILS.

AGE. (x)	Annual Premium, 3 per cent.	Annual Premium, 3½ per cent.	Annual Premium, 4 per cent.	Annual Premium, 5 per cent.	Annual Premium, 6 per cent.
53	.0413957	.0400533	.0387882	.0364714	.0344108
54	.0433470	.0420036	.0407355	.0384079	.0363308
55	.0454522	.0441103	.0428418	.0405084	.0384201
56	.0477128	.0463747	.0451081	.0427737	.0406788
57	.0501488	.0488173	.0475556	.0452262	.0431310
58	.0527198	.0513959	.0501401	.0478180	.0457252
59	.0553244	.0540049	.0527518	.0504309	.0483344
60	.0578955	.0565742	.0553178	.0529858	.0508739
61	.0603148	.0589808	.0577100	.0553451	.0531957
62	.0628266	.0614772	.0601893	.0577858	.0555930
63	.0655110	.0641457	.0628402	.0603967	.0581587
64	.0684770	.0670985	.0657779	.0632993	.0610204
65	.0717072	.0703168	.0689823	.0664708	.0641531
66	.0752752	.0738759	.0725305	.0699918	.0676405
67	.0792400	.0778359	.0764837	.0739256	.0715483
68	.0836328	.0822284	.0809737	.0783049	.0759098
69	.0885303	.0871316	.0857804	.0832127	.0808116
70	.0939777	.0925916	.0912508	.0886981	.0863049
71	.1001318	.0987691	.0974499	.0949345	.0925714
72	.1065144	.1051751	.1038774	.1013996	.0990679
73	.1128495	.1115273	.1102452	.1077939	.1054833
74	.1189730	.1176585	.1163822	.1139392	.1116323
75	.1244373	.1231102	.1218204	.1193470	.1170059
76	.1301879	.1288465	.1275413	.1250339	.1226552
77	.1359141	.1345497	.1332203	.1306614	.1282277
78	.1421624	.1407752	.1394218	.1368112	.1343217
79	.1497090	.1483126	.1469486	.1443127	.1417929
80	.1572767	.1558635	.1544811	.1518045	.1492394
81	.1662351	.1648192	.1634323	.1607422	.1581578
82	.1750537	.1736268	.1722274	.1695075	.1668882
83	.1849217	.1834930	.1820899	.1793582	.1767205
84	.1953887	.1939635	.1925623	.1898289	.1871830
85	.2073236	.2059225	.2045434	.2018484	.1992339
86	.2188272	.2174541	.2161011	.2134534	.2108796
87	.2290485	.2277018	.2263737	.2237719	.2212390
88	.2357062	.2343584	.2330287	.2304215	.2278802
89	.2437328	.2424073	.2410991	.2385327	.2360291
90	.2566936	.2554686	.2542603	.2518907	.2495800
91	.2581820	.2569814	.2557992	.2534876	.2512418
92	.2504376	.2491616	.2479079	.2454650	.2431025
93	.2421310	.2407278	.2393515	.2366748	.2340943
94	.2385659	.2370325	.2355291	.2326079	.2297952
95	.2370479	.2353562	.2336968	.2304713	.2273656
96	.2408606	.2390074	.2371885	.2336492	.2302370
97	.2518820	.2498755	.2479038	.2440627	.2403528
98	.2660039	.2638037	.2616391	.2574141	.2533241
99	.2902716	.2878564	.2854770	.2808230	.2763043
100	.3436526	.3410570	.3384965	.3334782	.3285922
101	.4196694	.4168258	.4140167	.4085015	.4031177
102	.5355127	.5323032	.5291285	.5228860	.5167790
103	.7263753	.7225790	.7188200	.7114178	.7041622
104	.9708738	.9661836	.9615385	.9523809	.9433962

M_x
 N_x = ANNUAL PREMIUM FOR A_x

TABLE XXI.

ANNUAL PREMIUM FOR AN INCREASING ASSURANCE OF \$1 PER ANNUM ON A SINGLE LIFE, PAYABLE AT THE END OF THE YEAR IN WHICH THE LIFE FAILS.

AGE.	Annual Premium, 3 per cent.	Annual Premium, 3½ per cent.	Annual Premium, 4 per cent.	Annual Premium, 5 per cent.	Annual Premium, 6 per cent.
0	.3822944	.3323738	.2917748	.2321496	.1930285
1	.3774378	.3257480	.2883395	.2201618	.1777560
2	.3770166	.3243191	.2808333	.2154603	.1709734
3	.3785222	.3251444	.2808939	.2138954	.1678208
4	.3815339	.3277433	.2829865	.2148465	.1676185
5	.3853504	.3312898	.2861643	.2171370	.1689791
6	.3897631	.3355423	.2901541	.2204365	.1715252
7	.3945199	.3402025	.2946128	.2243174	.1747512
8	.3994972	.3451254	.2993746	.2285736	.1784136
9	.4046167	.3502190	.3043334	.2330730	.1823563
10	.4098268	.3554222	.3094193	.2377276	.1864745
11	.4150906	.3606917	.3145811	.2424730	.1906910
12	.4203908	.3660054	.3197947	.2472782	.1949674
13	.4257308	.3713686	.3250654	.2521498	.1993119
14	.4311103	.3767811	.3303936	.2570887	.2037250
15	.4365299	.3822435	.3357793	.2620946	.2082070
16	.4419938	.3877606	.3412286	.2671758	.2127666
17	.4475140	.3933467	.3467586	.2723540	.2174313
18	.4530996	.3990139	.3523829	.2776476	.2222241
19	.4587532	.4047648	.3581057	.2830631	.2271528
20	.4644732	.4105982	.3639254	.2885986	.2322172
21	.4702579	.4165119	.3698404	.2942533	.2374159
22	.4761051	.4225040	.3758481	.3000247	.2427472
23	.4820084	.4285670	.3819401	.3059023	.2481991
24	.4879643	.4346966	.3881124	.3118816	.2537662
25	.4939692	.4408890	.3943598	.3179569	.2594419
26	.5000191	.4471392	.4006773	.3241212	.2652178
27	.5061127	.4534464	.4070638	.3303735	.2710929
28	.5122451	.4598046	.4135122	.3367052	.2770565
29	.5184194	.4662169	.4200265	.3431211	.2831142
30	.5246505	.4727021	.4266285	.3496496	.2893007
31	.5309601	.4792859	.4333488	.3563309	.2956665
32	.5373507	.4859720	.4401916	.3631723	.3022217
33	.5438214	.4927590	.4471569	.3701735	.3089672
34	.5503651	.4996399	.4542356	.3773261	.3158939
35	.5569756	.5066066	.4614199	.3846187	.3229898
36	.5636483	.5136550	.4687040	.3920471	.3302495
37	.5703791	.5207797	.4760832	.3996045	.3376663
38	.5771673	.5279797	.4835567	.4072906	.3452407
39	.5840113	.5352549	.4911233	.4151057	.3529733
40	.5909103	.5426029	.4987826	.4230487	.3608637
41	.5978711	.5500335	.5065441	.4311339	.3689307
42	.6049121	.5575676	.5144346	.4393961	.3772183
43	.6120444	.5652203	.5224700	.4478577	.3857556
44	.6192748	.5729993	.5306619	.4565362	.3945666
45	.6266029	.5809045	.5390107	.4654334	.4036572
46	.6340261	.5889350	.5475151	.4745510	.4130313
47	.6415377	.5970825	.5561681	.4838810	.4226823
48	.6491293	.6053378	.5649584	.4934125	.4326003
49	.6567856	.6136830	.5738667	.5031221	.4427594
50	.6644768	.6220846	.5828544	.5129628	.4531048
51	.6721803	.6305143	.5918898	.5228955	.4635901
52	.6798665	.6389391	.6009346	.5328710	.4741570

R_x
 N_x = ANNUAL PREMIUM FOR 1 A.

MORTALITY.

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TABLE XXI.

ANNUAL PREMIUM FOR AN INCREASING ASSURANCE OF £1 PER ANNUM ON A SINGLE LIFE, PAYABLE AT THE END OF THE YEAR IN WHICH THE LIFE FAILS.

AGE.	Annual Premium, 3 per cent.	Annual Premium, 3½ per cent.	Annual Premium, 4 per cent.	Annual Premium, 5 per cent.	Annual Premium, 6 per cent.
53	.6875285	.6473500	.6099780	.5428779	.4847926
54	.6951560	.6557356	.6190080	.5529001	.4954771
55	.7027395	.6640829	.6280087	.5629184	.5061888
56	.7102568	.6723680	.6369534	.5728980	.5168852
57	.7176905	.6805690	.6458160	.5828060	.5275251
58	.7250175	.6886580	.6545641	.5925995	.5380574
59	.7322280	.6966232	.6631833	.6022594	.5484550
60	.7393413	.7044872	.6716993	.6118168	.5587551
61	.7463987	.7122980	.6801673	.6213410	.5690405
62	.7534754	.7201448	.6886896	.6309624	.5794701
63	.7605869	.7280458	.6972883	.6407110	.5900827
64	.7677320	.7360000	.7059635	.6505881	.6008830
65	.7748860	.7439802	.7146838	.6605561	.6118281
66	.7820345	.7519684	.7234297	.6705935	.6228936
67	.7891472	.7599314	.7321635	.6806540	.6340273
68	.7961869	.7678242	.7408350	.6906763	.6451576
69	.8031124	.7756005	.7493904	.7005929	.6562036
70	.8098684	.7831954	.7577544	.7103118	.6670555
71	.8163918	.7905326	.7658432	.7197242	.6775838
72	.8225860	.7975016	.7735239	.7286632	.6875822
73	.8284412	.8040870	.7807822	.7371063	.6970208
74	.8339992	.8103376	.7876684	.7451125	.7059652
75	.8393312	.8163332	.7942746	.7527932	.7145452
76	.8445926	.8222570	.8008096	.7604090	.7230717
77	.8497874	.8281138	.8072790	.7679662	.7315540
78	.8549792	.8339778	.8137680	.7755752	.7401245
79	.8601508	.8398298	.8202564	.7832112	.7487604
80	.8651638	.8455092	.8265600	.7906495	.7571917
81	.8700706	.8510778	.8327520	.7979816	.7655317
82	.8747222	.8563628	.8386354	.8049620	.7734904
83	.8791800	.8614352	.8442902	.8116950	.7811917
84	.8833332	.8661678	.8495756	.8180052	.7884315
85	.8871162	.8704838	.8544004	.8237820	.7950784
86	.8903046	.8741220	.8584692	.8286566	.8006916
87	.8928666	.8770432	.8617330	.8325618	.8051856
88	.8948440	.8792926	.8642408	.8355514	.8086140
89	.8965818	.8812682	.8664428	.8381764	.8116296
90	.8978302	.8826774	.8680030	.8400156	.8137222
91	.8977234	.8825036	.8677530	.8395906	.8131008
92	.8973606	.8820084	.8671106	.8386152	.8117540
93	.8979606	.8826044	.8676798	.8390678	.8120180
94	.8999460	.8847908	.8700354	.8416772	.8147784
95	.9031446	.8883734	.8739642	.8461952	.8197620
96	.9077046	.8935312	.8796804	.8529106	.8273338
97	.9134682	.9000896	.8869898	.8616030	.8372556
98	.9201582	.9077304	.8955370	.8718400	.8490274
99	.9280504	.9167776	.9056986	.8841088	.8632472
100	.9370800	.9271650	.9174046	.8983376	.8798530
101	.9461209	.9375830	.9291636	.9126790	.8966452
102	.9550930	.9479377	.9408704	.9270010	.9134700
103	.9637529	.9579469	.9522032	.9409066	.9298510
104	.9708738	.9661836	.9615385	.9523809	.9433962

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$$\frac{R_x}{N_x} = \text{ANNUAL PREMIUM for I A}_x$$

II

TABLE XXII.

LOGARITHMS OF COMMUTATION TABLES FOR SINGLE LIVES.

AGE.	λD_x	λN_x	λS_x	λC_x	λM_x	λR_x
0	4.000 0000	5.262 9213	6.589 4188	3.174 4014	3.668 7707	4.845 3192
1	3.914 5845	5.238 5434	6.568 4423	2.808 1100	3.501 0532	4.815 3888
2	3.865 2494	5.217 4410	6.547 6333	2.664 7797	3.402 6231	4.793 8015
3	3.823 2616	5.197 6973	6.526 8389	2.389 5602	3.314 9111	4.775 7886
4	3.793 6250	5.178 9611	6.505 9929	2.239 0100	3.260 0082	4.760 4943
5	3.768 1312	5.160 6990	6.485 0428	2.005 7621	3.216 5225	4.746 5548
6	3.747 4930	5.142 7451	6.463 9594	1.823 9533	3.188 9327	4.733 5458
7	3.729 2883	5.124 9038	6.442 7199	1.660 7302	3.169 7747	4.720 9727
8	3.712 6142	5.107 0779	6.421 3092	1.517 9335	3.156 1116	4.708 5916
9	3.696 9104	5.089 2037	6.399 7166	1.390 1417	3.146 0039	4.696 2475
10	3.681 8603	5.071 2382	6.377 9336	1.321 1885	3.138 3169	4.683 8386
11	3.667 0690	5.053 1491	6.355 9533	1.337 3150	3.131 6491	4.671 2920
12	3.652 1333	5.034 9191	6.333 7702	1.338 2661	3.124 6189	4.658 5723
13	3.637 1192	5.016 5469	6.311 3788	1.338 7928	3.117 4572	4.645 6820
14	3.622 0255	4.998 0296	6.288 7738	1.351 5096	3.110 1666	4.632 6180
15	3.606 7821	4.979 3624	6.265 9490	1.385 6690	3.102 5294	4.619 3764
16	3.591 2481	4.960 5441	6.242 8990	1.405 0165	3.094 1132	4.605 9603
17	3.575 4878	4.941 5798	6.219 6172	1.402 3985	3.085 1353	4.592 3864
18	3.559 6373	4.922 4720	6.196 0963	1.389 5612	3.076 0237	4.578 6657
19	3.543 7657	4.903 2172	6.172 3285	1.376 7240	3.066 9909	4.564 7963
20	3.527 8728	4.883 8082	6.148 3052	1.363 8868	3.058 0375	4.550 7689
21	3.511 9583	4.864 2380	6.124 0182	1.340 8304	3.049 1645	4.536 5741
22	3.496 0941	4.844 4984	6.099 4583	1.327 9931	3.040 5798	4.522 2013
23	3.480 2086	4.824 5778	6.074 6164	1.315 1559	3.032 0794	4.507 6324
24	3.464 3017	4.804 4669	6.049 4831	1.302 3187	3.023 6639	4.492 8550
25	3.448 3729	4.784 1558	6.024 0487	1.299 7007	3.015 3350	4.477 8557
26	3.432 3475	4.763 6336	5.998 3030	1.286 8634	3.006 8946	4.462 6202
27	3.416 2984	4.742 8927	5.972 2365	1.293 7702	2.998 5400	4.447 1399
28	3.400 0745	4.721 9210	5.945 8384	1.326 6905	2.989 8837	4.431 3989
29	3.383 4429	4.700 7131	5.919 0980	1.363 0713	2.980 3480	4.415 3943
30	3.366 3164	4.679 2748	5.892 0038	1.357 9209	2.969 7359	4.399 1449
31	3.349 0692	4.657 6173	5.864 5430	1.345 0837	2.958 9878	4.382 6792
32	3.331 7768	4.635 7330	5.836 7008	1.324 5596	2.948 2919	4.365 9909
33	3.314 5177	4.613 6100	5.808 4610	1.303 8971	2.937 8381	4.349 0663
34	3.297 2932	4.591 2314	5.779 8072	1.291 0598	2.927 6303	4.331 8824
35	3.280 0239	4.568 5786	5.750 7221	1.278 2226	2.917 4847	4.314 4148
36	3.262 7090	4.545 6355	5.721 1881	1.273 2107	2.907 4025	4.296 6437
37	3.245 2647	4.522 3851	5.691 1863	1.268 0604	2.897 2006	4.278 5487
38	3.227 6874	4.498 8131	5.660 6977	1.262 7762	2.886 8778	4.260 1148
39	3.209 9732	4.474 9043	5.629 7017	1.271 8408	2.876 4331	4.241 3255
40	3.191 9470	4.450 6423	5.598 1768	1.293 2177	2.865 5026	4.222 1638
41	3.173 4248	4.426 0191	5.566 1000	1.299 6857	2.853 7162	4.202 6267
42	3.154 5635	4.401 0375	5.533 4468	1.299 2576	2.841 4166	4.182 7298
43	3.135 4391	4.375 6907	5.500 1886	1.286 4204	2.828 7712	4.162 4736
44	3.116 2223	4.349 9672	5.466 2945	1.273 5832	2.816 1315	4.141 8506
45	3.096 9105	4.323 8434	5.431 7306	1.254 5857	2.803 4975	4.120 8358
46	3.077 5939	4.297 2937	5.396 4601	1.235 4995	2.791 0501	4.099 4009
47	3.058 2738	4.270 2842	5.360 4434	1.209 8880	2.778 7941	4.077 5064
48	3.039 0477	4.242 7764	5.323 6391	1.170 3165	2.766 9145	4.055 1076
49	3.020 1161	4.214 7215	5.286 0033	1.143 4686	2.755 7781	4.032 1451
50	3.001 2953	4.186 0510	5.247 4894	1.116 1535	2.745 0423	4.008 5308
51	2.982 5910	4.156 7000	5.208 0512	1.124 8560	2.734 7136	3.984 1858
52	2.963 5020	4.126 5950	5.167 6420	1.132 5405	2.723 9163	3.959 0186

TABLE XXII.

LOGARITHMS OF COMMUTATION TABLES FOR SINGLE LIVES.

AGE.	λD_x	λN_x	λS_x	λC_x	λM_x	λR_x
53	2.944 0123	4.095 6881	5.126 2145	1.139 2988	2.712 6435	3.932 9788
54	2.924 1048	4.063 9275	5.083 7205	1.139 0506	2.700 8863	3.906 0098
55	2.903 8670	4.031 2536	5.040 1072	1.144 4383	2.688 8088	3.878 0480
56	2.883 1754	3.997 5935	4.995 3226	1.149 0918	2.676 2286	3.849 0089
57	2.862 0072	3.962 8709	4.949 3120	1.169 2549	2.663 1313	3.818 8081
58	2.839 9984	3.927 0008	4.902 0215	1.211 0866	2.648 9745	3.787 3493
59	2.816 5191	3.889 9163	4.853 3978	1.255 0724	2.632 8331	3.754 5626
60	2.791 2257	3.851 5981	4.803 3864	1.303 2891	2.614 2428	3.720 4431
61	2.763 5953	3.812 0586	4.751 9261	1.304 4626	2.592 4825	3.685 0294
62	2.734 9319	3.771 3667	4.698 9428	1.295 0585	2.569 5105	3.648 4358
63	2.705 5368	3.729 4750	4.644 3388	1.275 3276	2.545 7892	3.610 6238
64	2.675 7620	3.686 2977	4.588 0030	1.262 4904	2.521 8427	3.571 5073
65	2.645 2996	3.641 6952	4.529 8130	1.246 1649	2.497 2579	3.530 9331
66	2.614 2417	3.595 5353	4.469 6394	1.229 8110	2.472 1873	3.488 7612
67	2.582 5424	3.547 6487	4.407 3441	1.216 9738	2.446 5930	3.444 8068
68	2.549 9867	3.497 8353	4.342 7832	1.204 1366	2.420 2122	3.398 8503
69	2.516 4929	3.445 8768	4.275 8115	1.194 8160	2.392 9688	3.350 6531
70	2.481 7865	3.391 5145	4.206 2849	1.181 9787	2.364 5393	3.299 9289
71	2.445 9200	3.334 4626	4.134 0711	1.202 8246	2.335 0346	3.246 3612
72	2.406 7420	3.274 3520	4.059 0568	1.227 2355	2.301 7605	3.189 5333
73	2.363 2607	3.211 0465	3.981 1748	1.243 1700	2.263 5463	3.129 3082
74	2.315 0992	3.144 5462	3.900 3711	1.257 3162	2.219 9948	3.065 7119
75	2.261 2229	3.074 9349	3.816 5834	1.228 4909	2.169 8853	2.998 8682
76	2.204 7835	3.002 5293	3.729 7184	1.204 6583	2.117 0999	2.929 1765
77	2.144 7532	2.927 1631	3.639 5857	1.163 0494	2.060 4277	2.856 4734
78	2.082 5573	2.848 8287	3.545 9747	1.106 4331	2.001 6135	2.780 7843
79	2.019 6849	2.767 2320	3.448 6076	1.080 2320	1.942 4798	2.701 8066
80	1.952 1149	2.681 6623	3.347 1852	1.024 6428	1.878 3266	2.618 7606
81	1.882 9103	2.592 0717	3.241 4949	0.996 5656	1.812 7944	2.531 6262
82	1.807 6856	2.497 6726	3.131 2615	0.943 1105	1.740 8438	2.439 5428
83	1.728 9983	2.398 4874	3.016 3438	0.894 8010	1.665 4753	2.342 5652
84	1.645 1288	2.293 8837	2.896 5451	0.833 1152	1.584 7831	2.240 0083
85	1.557 1959	2.183 4569	2.771 8066	0.788 0933	1.500 1057	2.131 4374
86	1.460 6648	2.066 2945	2.642 1999	0.734 4198	1.406 3959	2.015 8332
87	1.354 4532	1.942 5393	2.508 1808	0.676 5042	1.302 4668	1.893 3259
88	1.235 8122	1.812 8410	2.370 3908	0.565 0572	1.185 2120	1.764 5883
89	1.115 1656	1.679 2273	2.229 5403	0.435 7144	1.066 1414	1.631 8172
90	0.996 9381	1.540 8458	2.085 8854	0.400 0143	0.950 2608	1.494 0400
91	0.853 0019	1.394 6538	1.940 1452	0.296 0966	0.806 5798	1.347 7963
92	0.694 0366	1.247 5555	1.794 5852	0.128 3574	0.646 2551	1.200 5225
93	0.538 5319	1.105 1506	1.649 6363	9.939 4289	0.489 2010	1.058 4079
94	0.395 3609	0.967 7253	1.503 6753	9.780 4637	0.345 3337	0.921 9418
95	0.257 5850	0.832 4190	1.354 2569	9.612 7244	0.207 2551	0.788 1763
96	0.129 3542	0.698 0119	1.198 9083	9.453 7592	0.079 7777	0.655 9564
97	0.010 0617	0.561 3427	1.034 2337	9.344 0120	9.962 5398	0.522 0361
98	9.888 0800	0.418 0666	0.856 0115	9.206 2361	9.842 9545	0.381 9291
99	9.770 5075	0.266 1754	0.658 9220	9.017 3075	9.728 9800	0.233 7470
100	9.670 5200	0.099 0688	0.433 5760	9.004 4703	9.635 1884	0.070 8455
101	9.548 5383	9.896 4897	0.163 6262	8.991 6331	9.519 3970	9.872 4363
102	9.389 5781	9.637 8022	9.825 8322	8.978 7959	9.366 5720	9.617 8479
103	9.154 8872	9.276 6518	9.371 6463	8.965 9586	9.137 8129	9.260 6175
104	8.664 9286	8.664 9286	8.664 9286	8.652 0914	8.652 0914	8.652 0914

TABLE XXIII.

LOGARITHMS OF COMMUTATION TABLES FOR SINGLE LIVES.

AGE.	λD_x	λN_x	λS_x	λC_x	λM_x	λR_x
0	4.000 0000	5.221 9859	6.517 3916	3.172 2983	3.639 7006	4.743 6127
1	3.912 4814	5.195 1224	6.494 8170	2.803 9037	3.458 6670	4.708 0041
2	3.861 0431	5.171 8563	6.472 4701	2.658 4704	3.349 9646	4.682 8288
3	3.816 9523	5.150 0886	6.450 1720	2.381 1477	3.251 1654	4.662 1650
4	3.785 2125	5.129 4382	6.427 8456	2.228 4944	3.188 2364	4.644 9720
5	3.757 6156	5.109 3203	6.405 4307	1.993 1433	3.137.7663	4.629 5283
6	3.734 8742	5.089 5540	6.382 8940	1.809 2315	3.105 4659	4.615 3013
7	3.714 5665	5.069 9259	6.360 2089	1.643 9052	3.082 9357	4.601 6634
8	3.695 7892	5.050 3291	6.337 3596	1.499 0054	3.066 8374	4.588 3060
9	3.677 9823	5.030 6944	6.314 3337	1.369 1104	3.054 9278	4.575 0341
10	3.660 8290	5.010 9751	6.291 1223	1.298 0542	3.045 8813	4.561 7197
11	3.643 9347	4.991 1358	6.267 7186	1.312 0775	3.038 0492	4.548 2719
12	3.626 8958	4.971 1587	6.244 1165	1.310 9255	3.029 8093	4.534 6463
13	3.609 7786	4.951 0427	6.220 3113	1.309 3490	3.021 4324	4.520 8479
14	3.592 5817	4.930 7842	6.196 2969	1.319 9628	3.012 9219	4.506 8733
15	3.575 2353	4.910 3788	6.172 0685	1.352 0190	3.004 0246	4.492 7189
16	3.557 5981	4.889 8256	6.147 6194	1.369 2634	2.994 2373	4.478 3893
17	3.539 7347	4.869 1308	6.122 9435	1.364 5422	2.983 8140	4.463 9064
18	3.521 7810	4.848 2973	6.098 0339	1.349 6019	2.973 2511	4.449 2854
19	3.503 8064	4.827 3217	6.072 8826	1.334 6615	2.962 7954	4.434 5245
20	3.485 8103	4.806 1971	6.047 4809	1.319 7212	2.952 4484	4.419 6141
21	3.467 7927	4.784 9160	6.021 8205	1.294 5616	2.942 2116	4.404 5434
22	3.449 8253	4.763 4703	5.995 8916	1.279 6213	2.932 3245	4.389 3011
23	3.431 8368	4.741 8478	5.969 6856	1.264 6809	2.922 5530	4.373 8665
24	3.413 8267	4.720 0390	5.943 1930	1.249 7406	2.912 8985	4.358 2252
25	3.395 7948	4.698 0337	5.916 4040	1.245 0194	2.903 3621	4.342 3629
26	3.377 6662	4.675 8208	5.889 3088	1.230 0791	2.893 7182	4.326 2635
27	3.359 5141	4.653 3926	5.861 8976	1.234 8827	2.884 1925	4.309 9186
28	3.341 1870	4.630 7365	5.834 1596	1.265 6999	2.874 3434	4.293 3099
29	3.322 4523	4.607 8473	5.806 0844	1.299 9775	2.863 5156	4.276 4353
30	3.303 2226	4.584 7323	5.777 6606	1.292 7241	2.851 4860	4.259 3198
31	3.283 8724	4.561 4038	5.748 8755	1.277 7837	2.839 3217	4.241 9985
32	3.264 4768	4.537 8548	5.719 7138	1.255 1565	2.827 2360	4.224 4661
33	3.245 1146	4.514 0730	5.690 1596	1.232 3908	2.815 4439	4.206 7075
34	3.225 7869	4.490 0411	5.660 1961	1.217 4505	2.803 9501	4.188 6982
35	3.206 4146	4.465 7401	5.629 8057	1.202 5101	2.792 5483	4.170 4110
36	3.186 9965	4.441 1538	5.598 9707	1.195 3951	2.781 2402	4.151 8253
37	3.167 4491	4.416 2646	5.567 6721	1.188 1416	2.769 8210	4.132 9187
38	3.147 7686	4.391 0581	5.535 8910	1.180 7544	2.758 2903	4.113 6754
39	3.127 9514	4.365 5192	5.503 6066	1.187 7158	2.746 6475	4.094 0799
40	3.107 8220	4.339 6315	5.470 7971	1.206 9896	2.734 4879	4.074 1136
41	3.087 1967	4.313 3874	5.437 4398	1.211 3544	2.721 4017	4.053 7766
42	3.066 2322	4.286 7910	5.403 5097	1.208 8233	2.707 7706	4.033 0886
43	3.045 0048	4.259 8363	5.368 9781	1.193 8829	2.693 7807	4.012 0540
44	3.023 6848	4.232 5123	5.333 8133	1.178 9426	2.679 8218	3.990 6663
45	3.002 2699	4.204 7956	5.297 9809	1.157 8419	2.665 8951	3.968 9004
46	2.980 8501	4.176 6603	5.261 4432	1.136 6527	2.652 2001	3.946 7277
47	2.959 4270	4.148 0721	5.224 1605	1.108 9380	2.638 7432	3.924 1065
48	2.938 0977	4.118 9918	5.186 0897	1.067 2634	2.625 7273	3.900 9896
49	2.917 0630	4.089 3695	5.147 1858	1.038 3123	2.613 5545	3.877 3136
50	2.896 1390	4.059 1349	5.107 4016	1.008 8942	2.601 8493	3.852 9843
51	2.875 3317	4.028 2210	5.066 6904	1.015 4935	2.590 6178	3.827 9160
52	2.854 1395	3.996 5520	5.025 0046	1.021 0749	2.578 9093	3.802 0115

TABLE XXIII.

LOGARITHMS OF COMMUTATION TABLES FOR SINGLE LIVES.

AGE.	λD_x	λN_x	λS_x	λC_x	λM_x	λR_x
53	2.832 5467	3.964 0801	4.982 2963	1.025 7300	2.566 7186	3.775 2193
54	2.810 5360	3.930 7522	4.938 5164	1.023 3788	2.554 0385	3.747 4810
55	2.788 1952	3.896 5088	4.893 6131	1.026 6633	2.541 0487	3.718 7311
56	2.765 4004	3.861 2743	4.847 5327	1.029 2137	2.527 5552	3.688 8813
57	2.742 1291	3.824 9719	4.800 2211	1.047 2736	2.513 5455	3.657 8441
58	2.718 0171	3.787 5146	4.751 6245	1.087 0023	2.498 4432	3.625 5182
59	2.692 4348	3.748 8348	4.701 6897	1.128 8849	2.481 2678	3.591 8327
60	2.665 0382	3.708 9148	4.650 3634	1.174 9985	2.461 5331	3.556 7879
61	2.635 3047	3.667 7698	4.597 5848	1.174 0688	2.438 4804	3.520 4315
62	2.604 5381	3.625 4741	4.543 2800	1.162 5617	2.414 1884	3.482 8939
63	2.573 0400	3.581 9817	4.487 3501	1.140 7276	2.389 1495	3.444 1404
64	2.541 1620	3.537 2065	4.429 6827	1.125 7873	2.363 9194	3.404 0843
65	2.508 5965	3.491 0074	4.370 1530	1.107 3586	2.338 0663	3.362 5688
66	2.475 4354	3.443 2507	4.308 6301	1.088 9017	2.311 7535	3.319 4502
67	2.441 6331	3.393 7654	4.244 9735	1.073 9613	2.284 9452	3.274 5398
68	2.406 9742	3.342 3485	4.179 0368	1.059 0210	2.257 3701	3.227 6103
69	2.371 3773	3.288 7787	4.110 6722	1.047 5972	2.228 9542	3.178 4168
70	2.334 5677	3.232 7931	4.039 7345	1.032 6569	2.199 3646	3.126 6632
71	2.296 5982	3.174 1020	3.966 0893	1.051 3996	2.168 7231	3.072 0218
72	2.255 3170	3.112 3285	3.889 6232	1.073 7074	2.134 2415	3.014 0600
73	2.209 7326	3.047 3360	3.810 2705	1.087 5387	2.094 7173	2.952 6391
74	2.159 4679	2.979 1274	3.727 9808	1.099 5819	2.049 7505	2.887 7934
75	2.103 4886	2.907 7920	3.642 6951	1.068 6534	1.998 0860	2.819 6595
76	2.044 9460	2.833 6574	3.554 3223	1.042 7177	1.943 7301	2.748 6650
77	1.982 8126	2.756 5577	3.462 6708	0.999 0056	1.885 4406	2.674 6477
78	1.918 5135	2.676 4900	3.367 5282	0.940 2863	1.825 0163	2.597 6444
79	1.853 5381	2.593 1588	3.268 6127	0.911 9820	1.764 3370	2.517 3501
80	1.783 8649	2.505 8435	3.165 6191	0.854 2897	1.698 5880	2.432 9618
81	1.712 5572	2.414 5000	3.058 3315	0.824 1093	1.631 5078	2.344 4693
82	1.635 2293	2.318 3301	2.946 4692	0.768 5512	1.557 9468	2.250 9879
83	1.554 4390	2.217 3605	2.829 8868	0.718 1385	1.480 9800	2.152 5831
84	1.468 4663	2.110 9508	2.708 3815	0.654 3496	1.398 6709	2.048 5528
85	1.378 4303	1.998 6917	2.581 8885	0.607 2245	1.312 3955	1.938 4524
86	1.279 7960	1.879 6545	2.450 4756	0.551 4479	1.217 0221	1.821 2266
87	1.171 4813	1.753 9794	2.314 6039	0.491 4292	1.111 3458	1.697 0004
88	1.050 7372	1.622 3192	2.174 9255	0.377 8791	0.992 1998	1.566 4526
89	0.927 9875	1.486 7265	2.032 1665	0.246 4331	0.871 2721	1.431 8346
90	0.807 6568	1.346 3309	1.886 5858	0.208 6299	0.753 6685	1.292 1329
91	0.661 6175	1.198 0263	1.738 9231	0.102 6091	0.607 9280	1.143 7428
92	0.500 5491	1.048 7964	1.591 5200	9.932 7668	0.445 2775	0.994 2691
93	0.342 9413	0.904 3289	1.444 8531	9.741 7351	0.285 8551	0.850 0950
94	0.197 6671	0.764 9398	1.297 2993	9.580 6668	0.139 7478	0.711 7804
95	0.057 7881	0.627 7572	1.146 3981	9.410 8244	9.999 4829	0.576 3528
96	9.927 4542	0.491 5721	0.989 6672	9.249 7561	9.869 9834	0.442 6818
97	9.806 0586	0.353 2118	0.823 6948	9.137 9057	9.750 9354	0.307 4975
98	9.681 9737	0.208 3116	0.644 2460	8.998 0267	9.629 5925	0.166 2685
99	9.562 2981	0.054 8838	0.445 9975	8.806 9950	9.514 0597	0.017 1478
100	9.460 2075	9.886 3230	0.219 5376	8.792 0547	9.419 1500	9.853 4801
101	9.336 1227	9.682 2910	9.948 4706	8.777 1143	9.302 2456	9.654 3007
102	9.175 0543	9.422 1465	9.609 5477	8.762 1740	9.148 3056	9.398 9263
103	8.938 2653	9.059 5168	9.154 1993	8.747 2336	8.918 4021	9.040 8582
104	8.446 2036	8.446 2036	8.446 2036	8.431 2633	8.431 2633	8.431 2633

TABLE XXIV.

LOGARITHMS OF COMMUTATION TABLES FOR SINGLE LIVES.

AGE.	λD_x	λN_x	λS_x	λC_x	λM_x	λR_x
0	4.000 0000	5.184 1699	6.449 3149	3.170 2053	3.615 1548	4.649 2177
1	3.910 3884	5.154 7780	6.425 0651	2.799 7177	3.422 0376	4.607 0852
2	3.856 8571	5.129 3060	6.401 1087	2.652 1914	3.303 6474	4.577 7547
3	3.810 6733	5.105 4717	6.377 2381	2.372 7757	3.193 9998	4.554 0140
4	3.776 8405	5.082 8650	6.353 3656	2.218 0294	3.122 9432	4.534 6307
5	3.747 1506	5.060 8500	6.329 4212	1.980 5854	3.065 2109	4.517 4655
6	3.722 3163	5.039 2301	6.305 3676	1.794 5805	3.027 9140	4.501 8589
7	3.699 9155	5.017 7740	6.281 1747	1.627 1613	3.001 7649	4.487 0256
8	3.679 0453	4.996 3653	6.256 8245	1.480 1684	2.983 0360	4.472 5803
9	3.659 1453	4.974 9296	6.232 3040	1.348 1805	2.969 1739	4.458 2793
10	3.639 8991	4.953 4160	6.207 6039	1.275 0313	2.958 6533	4.443 9634
11	3.620 9118	4.931 7871	6.182 7165	1.286 9616	2.949 5604	4.429 5197
12	3.601 7799	4.910 0227	6.157 6360	1.283 7166	2.940 0116	4.414 8939
13	3.582 5697	4.888 1226	6.132 3577	1.280 0471	2.930 3215	4.400 0933
14	3.563 2798	4.866 0830	6.106 8759	1.288 5679	2.920 4949	4.385 1146
15	3.543 8404	4.843 8997	6.081 1852	1.318 5312	2.910 2388	4.369 9536
16	3.524 1103	4.821 5721	6.055 2800	1.333 6825	2.898 9748	4.354 6176
17	3.504 1538	4.799 1071	6.029 1540	1.326 8684	2.886 9943	4.339 1343
18	3.484 1072	4.776 5086	6.002 8000	1.309 8351	2.874 8686	4.323 5235
19	3.464 0396	4.753 7732	5.976 2100	1.292 8017	2.862 8811	4.307 7845
20	3.443 9505	4.730 8941	5.949 3754	1.275 7684	2.851 0339	4.291 9065
21	3.423 8399	4.707 8634	5.922 2874	1.248 5158	2.839 3293	4.275 8778
22	3.403 7795	4.684 6732	5.894 9370	1.231 4825	2.828 0416	4.259 6856
23	3.383 6980	4.661 3107	5.867 3147	1.214 4492	2.816 9042	4.243 3059
24	3.363 5950	4.637 7662	5.839 4114	1.197 4158	2.805 9189	4.226 7236
25	3.343 4700	4.614 0291	5.811 2171	1.190 6017	2.795 0875	4.209 9218
26	3.323 2485	4.590 0882	5.782 7224	1.173 5683	2.784 1542	4.192 8829
27	3.303 0033	4.565 9354	5.753 9170	1.176 2790	2.773 3753	4.175 5979
28	3.282 5833	4.541 5583	5.724 7907	1.205 0032	2.762 2519	4.158 0466
29	3.261 7556	4.516 9516	5.695 3331	1.237 1878	2.750 0444	4.140 2283
30	3.240 4329	4.492 1234	5.665 5329	1.227 8414	2.736 5025	4.122 1733
31	3.218 9897	4.467 0882	5.635 3775	1.210 8080	2.722 8270	4.103 9258
32	3.197 5011	4.441 8390	5.604 8516	1.186 0878	2.709 2584	4.085 4808
33	3.176 0459	4.416 3635	5.573 9389	1.161 2292	2.696 0393	4.066 8234
34	3.154 6253	4.390 6440	5.542 6226	1.144 1958	2.683 1748	4.047 9252
35	3.133 1599	4.364 6607	5.510 8847	1.127 1625	2.670 4351	4.028 7570
36	3.111 6489	4.338 3975	5.478 7074	1.117 9544	2.657 8226	4.009 2962
37	3.090 0084	4.311 8363	5.446 0718	1.108 6080	2.645 1093	3.989 5192
38	3.068 2350	4.284 9629	5.412 9588	1.099 1278	2.632 2956	3.969 4103
39	3.046 3248	4.257 7619	5.379 3474	1.103 9962	2.619 3816	3.948 9525
40	3.024 1024	4.230 2164	5.345 2160	1.121 1770	2.605 9196	3.928 1276
41	3.001 3841	4.202 3205	5.310 5419	1.123 4488	2.591 4567	3.906 9377
42	2.978 3266	4.174 0785	5.275 2996	1.118 8247	2.576 4158	3.885 4087
43	2.955 0062	4.145 4860	5.239 4601	1.101 7914	2.561 0031	3.863 5474
44	2.931 5933	4.116 5326	5.202 9918	1.084 7580	2.545 6490	3.841 3505
45	2.908 0853	4.087 1945	5.165 8590	1.061 5644	2.530 3551	3.818 7919
46	2.884 5726	4.057 4463	5.128 0233	1.038 2822	2.515 3417	3.795 8425
47	2.861 0565	4.027 2521	5.089 4442	1.008 4745	2.500 6163	3.772 4582
48	2.837 6342	3.996 5734	5.050 0777	0.964 7069	2.486 4018	3.748 5899
49	2.814 5065	3.965 3587	5.009 8777	0.933 6628	2.473 1369	3.724 1697
50	2.791 4895	3.933 5353	4.968 7963	0.902 1517	2.460 4120	3.699 0954
51	2.768 5892	3.901 0350	4.926 7856	0.906 6581	2.448 2333	3.673 2759
52	2.745 3041	3.867 7798	4.883 7974	0.910 1464	2.435 5706	3.646 6070

TABLE XXIV.

LOGARITHMS OF COMMUTATION TABLES FOR SINGLE LIVES.

AGE.	λD_x	λN_x	λS_x	λC_x	λM_x	λR_x
53	2.721 6182	3.833 7212	4.839 7837	0.912 7086	2.422 4210	3.619 0354
54	2.697 5146	3.798 8054	4.794 6946	0.908 2643	2.408 7789	3.590 5017
55	2.673 0807	3.762 9722	4.748 4780	0.909 4559	2.394 8408	3.560 9379
56	2.648 1930	3.726 1442	4.701 0797	0.909 9133	2.380 3992	3.530 2519
57	2.622 8287	3.688 2437	4.652 4458	0.925 8802	2.365 4453	3.498 3525
58	2.596 6237	3.649 1817	4.602 5224	0.963 5159	2.349 3673	3.465 1339
59	2.568 9484	3.608 8899	4.551 2570	1.003 3055	2.331 1275	3.430 5235
60	2.539 4588	3.567 3519	4.498 5970	1.047 3261	2.310 2165	3.394 5268
61	2.507 6323	3.524 5857	4.444 4822	1.044 3035	2.285 8367	3.357 2015
62	2.474 7728	3.480 6718	4.388 8390	1.030 7033	2.260 1914	3.318 6954
63	2.441 1816	3.435 5649	4.331 5674	1.006 7763	2.233 8023	3.278 9773
64	2.407 2107	3.389 1788	4.272 5536	0.989 7429	2.207 2586	3.237 9610
65	2.372 5521	3.341 3709	4.211 6707	0.969 2213	2.180 1084	3.195 4848
66	2.337 2981	3.292 0063	4.148 7855	0.948 6714	2.152 5268	3.151 4026
67	2.301 4028	3.240 9120	4.083 7555	0.931 6380	2.124 4807	3.105 5201
68	2.264 6509	3.187 8822	4.016 4316	0.914 6047	2.095 6895	3.057 6037
69	2.226 9610	3.132 6928	3.946 6645	0.901 0879	2.066 0809	3.007 4009
70	2.188 0584	3.075 0771	3.874 3060	0.884 0546	2.035 3140	2.954 6055
71	2.147 9959	3.014 7397	3.799 2202	0.900 7044	2.003 5212	2.898 8795
72	2.104 6218	2.951 2979	3.721 2938	0.920 9191	1.967 8191	2.839 7716
73	2.056 9443	2.884 6136	3.640 4631	0.932 6575	1.926 9734	2.777 1435
74	2.004 5867	2.814 6929	3.556 6805	0.942 6077	1.880 5796	2.711 0363
75	1.946 5144	2.741 6299	3.469 8907	0.909 5862	1.827 3498	2.641 6006
76	1.885 8788	2.665 7634	3.380 0049	0.881 5575	1.771 4141	2.569 2927
77	1.821 6524	2.586 9279	3.286 8302	0.835 7524	1.711 4984	2.493 9516
78	1.755 2603	2.505 1250	3.190 1530	0.774 9401	1.649 4558	2.415 6256
79	1.688 1919	2.420 0584	3.089 6864	0.744 5429	1.587 2238	2.334 0080
80	1.616 4258	2.330 9974	2.985 1204	0.684 7575	1.519 8729	2.248 2718
81	1.543 0250	2.237 9020	2.876 2356	0.652 4842	1.451 2398	2.158 4177
82	1.463 6042	2.139 9625	2.762 7447	0.594 8330	1.376 0646	2.063 5357
83	1.380 7208	2.037 2109	2.644 4993	0.542 3274	1.297 4968	1.963 7026
84	1.292 6552	1.928 9982	2.521 2894	0.476 4455	1.213 5695	1.858 2003
85	1.200 5262	1.814 9110	2.393 0450	0.427 2274	1.125 6965	1.746 5724
86	1.099 7989	1.694 0041	2.259 8286	0.369 3578	1.028 6611	1.627 7288
87	0.989 3912	1.566 4153	2.122 1070	0.307 2461	0.921 2414	1.501 7880
88	0.866 5541	1.432 7999	1.980 5428	0.191 6030	0.800 2093	1.369 4347
89	0.741 7114	1.295 2353	1.835 8760	0.058 0641	0.677 4309	1.232 9752
90	0.619 2878	1.152 8327	1.688 3694	0.018 1678	0.558 1112	1.091 3539
91	0.471 1554	1.002 4232	1.538 7812	9.910 0541	0.410 3223	0.940 8193
92	0.307 9941	0.851 0673	1.389 5306	9.738 1187	0.245 3577	0.789 1418
93	0.148 2932	0.704 5406	1.241 1404	9.544 9941	0.083 5768	0.642 9001
94	0.000 9261	0.563 1903	1.091 9886	9.381 8328	9.935 2349	0.502 7272
95	9.858 9541	0.424 1324	0.939 5991	9.209 8974	9.792 7851	0.365 6261
96	9.726 5272	0.286 1693	0.781 4815	9.046 7361	9.661 2629	0.230 4942
97	9.603 0386	0.146 1181	0.614 2076	8.932 7927	9.540 4013	0.094 0367
98	9.476 8607	9.999 5939	0.433 5290	8.790 8207	9.417 2964	9.951 6774
99	9.355 0921	9.844 6295	0.234 1198	8.597 6961	9.300 2006	9.801 6132
100	9.250 9086	9.674 6156	0.006 5451	8.580 6627	9.204 1697	9.637 1765
101	9.124 7307	9.469 1331	9.734 3614	8.563 6294	9.086 1509	9.437 2253
102	8.961 5694	9.207 5345	9.394 3110	8.546 5961	8.931 0957	9.181 0643
103	8.722 6874	8.843 4299	8.937 8027	8.529 5627	8.700 0501	8.822 1596
104	8.228 5327	8.228 5327	8.228 5327	8.211 4994	8.211 4994	8.211 4994

TABLE XXV.

LOGARITHMS OF COMMUTATION TABLES FOR SINGLE LIVES.

AGE.	λD_x	λN_x	λS_x	λC_x	λM_x	λR_x
0	4.000 0000	5.116 7080	6.324 2040	3.166 0493	3.576 3401	4.482 4759
1	3.906 2324	5.082 1755	6.296 3995	2.791 4058	3.362 5343	4.424 9174
2	3.848 5452	5.052 2017	6.269 0359	2.639 7235	3.226 7754	4.385 5691
3	3.798 2054	5.024 1420	6.241 8417	2.356 1519	3.096 7164	4.354 3436
4	3.760 2167	4.997 5296	6.214 7035	2.197 2496	3.009 6111	4.329 6579
5	3.726 3708	4.971 6261	6.187 5312	1.955 6496	2.936 9602	4.308 3599
6	3.697 3805	4.946 2060	6.160 2770	1.765 4888	2.889 0756	4.289 4894
7	3.670 8238	4.921 0002	6.132 9036	1.593 9136	2.855 1075	4.271 8632
8	3.645 7976	4.895 8750	6.105 3889	1.442 7648	2.830 6297	4.254 9010
9	3.621 7417	4.870 7438	6.077 7174	1.306 6209	2.812 4760	4.238 2357
10	3.598 3395	4.845 5485	6.049 8782	1.229 3157	2.798 7104	4.221 6281
11	3.575 1962	4.820 2460	6.021 8634	1.237 0901	2.786 8443	4.204 9094
12	3.551 9084	4.794 8135	5.993 6672	1.229 6891	2.774 4213	4.187 9994
13	3.528 5422	4.769 2513	5.965 2852	1.221 8637	2.761 8517	4.170 9100
14	3.505 0964	4.743 5557	5.936 7119	1.226 2285	2.749 1420	4.153 6387
15	3.481 5010	4.717 7225	5.907 9424	1.252 0358	2.735 9147	4.136 1806
16	3.457 6149	4.691 7517	5.878 9710	1.263 0312	2.721 4226	4.118 5488
17	3.433 5025	4.665 6523	5.849 7918	1.252 0611	2.706 0390	4.100 7861
18	3.409 2999	4.639 4295	5.820 3978	1.230 8718	2.690 4952	4.082 9235
19	3.385 0763	4.613 0805	5.790 7808	1.209 6825	2.675 1558	4.064 9638
20	3.360 8313	4.586 5984	5.760 9323	1.188 4932	2.660 0253	4.046 8926
21	3.336 5647	4.559 9752	5.730 8433	1.157 0847	2.645 1080	4.028 6965
22	3.312 3484	4.533 2024	5.700 5046	1.135 8954	2.630 7558	4.010 3594
23	3.288 1109	4.506 2667	5.669 9067	1.114 7061	2.616 6315	3.991 8495
24	3.263 8519	4.479 1578	5.639 0403	1.093 5168	2.602 7389	3.973 1476
25	3.239 5710	4.451 8647	5.607 8959	1.082 5467	2.589 0813	3.954 2330
26	3.215 1935	4.424 3755	5.576 4636	1.061 3574	2.575 3375	3.935 0828
27	3.190 7924	4.396 6822	5.544 7340	1.059 9121	2.561 8312	3.915 6874
28	3.166 2164	4.368 7711	5.512 6969	1.084 4803	2.547 9383	3.896 0210
29	3.141 2327	4.340 6379	5.480 3425	1.112 5090	2.532 7361	3.876 0853
30	3.115 7541	4.312 2929	5.447 6597	1.099 0066	2.515 9116	3.855 9260
31	3.090 1549	4.283 7541	5.414 6361	1.077 8173	2.498 9553	3.835 6076
32	3.064 5104	4.255 0148	5.381 2561	1.048 9411	2.482 1668	3.815 1275
33	3.038 8992	4.226 0630	5.347 5033	1.019 9265	2.465 8479	3.794 4683
34	3.013 3226	4.196 8799	5.313 3602	0.998 7372	2.450 0077	3.773 5967
35	2.987 7013	4.167 4453	5.278 8087	0.977 5479	2.434 3650	3.752 4757
36	2.962 0343	4.137 7417	5.243 8310	0.964 1839	2.418 9244	3.731 0800
37	2.936 2379	4.107 7511	5.208 4080	0.950 6815	2.403 4085	3.709 3814
38	2.910 3085	4.077 4592	5.172 5200	0.937 0453	2.387 8191	3.687 3635
39	2.884 2423	4.046 8501	5.136 1467	0.937 7578	2.372 1582	3.665 0088
40	2.857 8640	4.015 9073	5.099 2662	0.950 7826	2.355 8841	3.642 2976
41	2.830 9897	3.984 6260	5.061 8553	0.948 8985	2.338 4511	3.619 2381
42	2.803 7763	3.953 0135	5.023 8888	0.940 1184	2.320 3694	3.595 8697
43	2.776 2999	3.921 0671	4.985 3374	0.918 9291	2.301 8878	3.572 2072
44	2.748 7310	3.888 7775	4.946 1675	0.897 7398	2.283 5233	3.548 2527
45	2.721 0671	3.856 1215	4.906 3426	0.870 3902	2.265 2807	3.523 9791
46	2.693 3984	3.823 0732	4.865 8230	0.842 9520	2.247 4243	3.499 3561
47	2.665 7263	3.789 5966	4.824 5659	0.808 9884	2.229 9656	3.474 3352
48	2.638 1481	3.755 6516	4.782 5256	0.761 0648	2.213 1707	3.448 8617
49	2.610 8644	3.721 1849	4.739 6539	0.725 8648	2.197 5587	3.422 8583
50	2.583 6915	3.686 1196	4.695 9009	0.690 1977	2.182 6469	3.396 2055
51	2.556 6352	3.650 3839	4.651 2168	0.690 5481	2.168 4427	3.368 7988
52	2.529 1941	3.613 8958	4.605 5517	0.689 8805	2.153 7460	3.340 5179

TABLE XXV.

LOGARITHMS OF COMMUTATION TABLES FOR SINGLE LIVES.

AGE.	λD_x	λN_x	λS_x	λC_x	λM_x	λR_x
53	2.501 3523	3.576 6056	4.558 8571	0.688 2868	2.138 5585	3.311 3077
54	2.473 0928	3.538 4581	4.511 0820	0.679 6866	2.122 8790	3.281 1048
55	2.444 5030	3.499 3915	4.462 1734	0.676 7222	2.106 9371	3.249 8370
56	2.415 4593	3.459 3256	4.412 0767	0.673 0236	2.090 5025	3.217 4029
57	2.385 9390	3.418 1794	4.360 7372	0.684 8346	2.073 5691	3.183 7034
58	2.355 5781	3.375 8608	4.308 1017	0.718 3143	2.055 4525	3.148 6221
59	2.323 7468	3.332 2996	4.254 1190	0.753 9480	2.034 9960	3.112 0832
60	2.290 1013	3.287 4822	4.198 7379	0.793 8126	2.011 6419	3.074 1037
61	2.254 1188	3.241 4327	4.141 9001	0.786 6340	1.984 5120	3.034 7627
62	2.217 1033	3.194 2426	4.083 5324	0.768 8779	1.956 0639	2.994 2461
63	2.179 3562	3.145 8689	4.023 5327	0.740 7949	1.926 8824	2.952 5311
64	2.141 2293	3.096 2260	3.961 7836	0.719 6056	1.897 6246	2.909 5322
65	2.102 4148	3.045 1680	3.898 1549	0.694 9280	1.867 7987	2.865 0778
66	2.063 0048	2.992 5576	3.832 5091	0.670 2221	1.837 6045	2.819 0169
67	2.022 9535	2.938 2178	3.764 6987	0.649 0328	1.807 0124	2.771 1442
68	1.982 0457	2.881 9375	3.694 5698	0.627 8435	1.775 7262	2.721 2121
69	1.940 1998	2.823 4868	3.621 9681	0.610 1708	1.743 6762	2.668 9525
70	1.897 1413	2.762 5906	3.546 7410	0.588 9815	1.710 5051	2.614 0396
71	1.852 9228	2.698 9449	3.468 7498	0.601 4753	1.676 3688	2.556 1110
72	1.805 3927	2.632 1520	3.387 8799	0.617 5341	1.638 1883	2.494 6788
73	1.753 5593	2.562 0720	3.304 0716	0.625 1165	1.594 6663	2.429 6021
74	1.697 0457	2.488 7164	3.217 2844	0.630 9107	1.545 3897	2.360 9383
75	1.634 8174	2.412 1893	3.127 4690	0.593 7333	1.489 0007	2.288 8649
76	1.570 0259	2.332 8519	3.034 5426	0.561 5486	1.429 8796	2.213 8991
77	1.501 6435	2.250 5398	2.938 3099	0.511 5876	1.366 6870	2.135 8819
78	1.431 0955	2.165 2633	2.838 5542	0.446 6193	1.301 3849	2.054 8872
79	1.359 8711	2.076 7245	2.734 9800	0.412 0661	1.236 0289	1.970 6034
80	1.283 9490	1.984 1725	2.627 2658	0.348 1248	1.165 4572	1.882 1566
81	1.206 3923	1.887 5753	2.515 1862	0.311 6955	1.093 7053	1.789 5681
82	1.122 8155	1.786 1025	2.398 4409	0.249 8884	1.015 2914	1.691 8779
83	1.035 7762	1.679 7940	2.276 8750	0.193 2268	0.933 5152	1.589 1869
84	0.943 5546	1.567 9863	2.150 2638	0.123 1889	0.846 3485	1.480 7424
85	0.847 2696	1.450 2558	2.018 5258	0.069 8149	0.755 2811	1.366 0681
86	0.742 3864	1.325 6253	1.881 7129	0.007 7893	0.654 9285	1.243 9999
87	0.627 8227	1.194 2273	1.740 3009	9.941 5217	0.544 0329	1.114 6437
88	0.500 8297	1.056 7215	1.594 9726	9.821 7226	0.419 2445	0.978 6946
89	0.371 8310	0.915 2346	1.446 4958	9.684 0277	0.292 7824	0.838 5700
90	0.245 2514	0.768 8404	1.295 1372	9.639 9755	0.170 0525	0.693 1278
91	0.092 9631	0.614 2426	1.141 6921	9.527 7058	0.018 1993	0.538 3102
92	9.925 6458	0.458 6536	0.988 7343	9.351 6145	9.848 6431	0.382 2163
93	9.761 7890	0.308 0214	0.836 8828	9.154 3339	9.682 1735	0.231 8184
94	9.610 2659	0.162 7558	0.684 5198	8.987 0166	9.529 3803	0.087 9013
95	9.464 1379	0.019 9517	0.529 1392	8.810 9253	9.382 5686	9.947 4223
96	9.327 5551	9.878 4343	0.368 2348	8.643 6080	9.246 9986	9.809 3378
97	9.199 9105	9.735 0011	0.198 3469	8.525 5087	9.122 5026	9.670 3083
98	9.069 5767	9.585 2295	0.015 2004	8.379 3807	8.995 8619	9.525 6663
99	8.943 6521	9.427 1934	9.813 4646	8.182 1001	8.875 6261	9.373 6991
100	8.835 3126	9.254 2768	9.583 6586	8.160 9108	8.777 3442	9.207 7164
101	8.704 9788	9.045 8994	9.309 2423	8.139 7215	8.657 0931	9.006 2174
102	8.537 6615	8.781 4024	8.966 9411	8.118 5322	8.499 8094	8.748 4826
103	8.294 6235	8.414 3609	8.508 1200	8.097 3429	8.266 4857	8.387 9075
104	7.796 3129	7.796 3129	7.796 3129	7.775 1236	7.775 1236	7.775 1236

TABLE XXVI.

LOGARITHMS OF COMMUTATION TABLES FOR SINGLE LIVES.

AGE.	λD_x	λN_x	λS_x	λC_x	λM_x	λR_x
0	4.000 0000	5.058 4150	6.212 4278	3.161 9327	3.547 1212	4.344 0364
1	3.902 1158	5.018 6884	6.180 8438	2.783 1727	3.316 5584	4.268 5127
2	3.840 3121	4.984 1448	6.149 8680	2.627 3738	3.166 0827	4.217 0732
3	3.785 8557	4.951 7831	6.119 1546	2.339 6856	3.017 7923	4.176 6289
4	3.743 7504	4.921 0847	6.088 5617	2.176 6668	2.915 5061	4.145 4066
5	3.705 7880	4.891 2101	6.057 9767	1.930 9502	2.828 0167	4.119 0430
6	3.672 6811	4.861 9057	6.027 3398	1.736 6728	2.769 1573	4.096 2337
7	3.642 0078	4.832 8656	5.996 6051	1.560 9811	2.726 8637	4.075 2859
8	3.612 8651	4.803 9382	5.965 7460	1.405 7157	2.696 1619	4.055 3661
9	3.584 6926	4.775 0255	5.934 7443	1.265 4552	2.673 3213	4.035 9462
10	3.557 1738	4.746 0620	5.903 5877	1.184 0335	2.656 0013	4.016 6815
11	3.529 9140	4.716 9985	5.872 2675	1.187 6913	2.641 0992	3.997 3287
12	3.502 5096	4.687 8100	5.840 7780	1.176 1738	2.625 5347	3.977 7720
13	3.475 0269	4.658 4972	5.809 1151	1.164 2318	2.609 8217	3.958 0304
14	3.447 4645	4.629 0562	5.777 2739	1.164 4800	2.593 9693	3.938 1007
15	3.419 7525	4.599 4832	5.745 2495	1.186 1708	2.577 5066	3.917 9785
16	3.391 7499	4.569 7787	5.713 0370	1.193 0496	2.559 5005	3.897 6821
17	3.363 5209	4.539 9536	5.680 6307	1.177 9629	2.540 4089	3.877 2756
18	3.335 2017	4.510 0148	5.648 0240	1.152 6571	2.521 1363	3.856 8059
19	3.306 8616	4.479 9602	5.615 2084	1.127 3512	2.502 1356	3.836 2783
20	3.278 5000	4.449 7823	5.582 1753	1.102 0453	2.483 4147	3.815 6766
21	3.250 1168	4.419 4736	5.548 9159	1.066 5203	2.464 9815	3.794 9835
22	3.221 7840	4.389 0254	5.515 4208	1.041 2144	2.447 2746	3.774 1796
23	3.193 4299	4.358 4230	5.481 6805	1.015 9085	2.429 8808	3.753 2233
24	3.165 0543	4.327 6562	5.447 6856	0.990 6027	2.412 8073	3.732 0901
25	3.136 6569	4.296 7133	5.413 4268	0.975 5160	2.396 0607	3.710 7535
26	3.108 1628	4.265 5817	5.378 8948	0.950 2101	2.379 2488	3.689 1844
27	3.079 6451	4.234 2535	5.344 0801	0.944 6483	2.362 7687	3.667 3717
28	3.050 9526	4.202 7142	5.308 9731	0.965 0999	2.345 8607	3.645 2826
29	3.021 8523	4.170 9598	5.273 5644	0.989 0120	2.327 4012	3.622 9214
30	2.992 2571	4.139 0036	5.237 8440	0.971 3931	2.307 0048	3.600 3530
31	2.962 5414	4.106 8664	5.201 7992	0.946 0872	2.286 4744	3.577 6686
32	2.932 7803	4.074 5426	5.165 4147	0.913 0944	2.266 1738	3.554 8682
33	2.903 0525	4.042 0204	5.128 6735	0.879 9633	2.246 4715	3.531 9328
34	2.873 3594	4.009 2801	5.091 5579	0.854 6574	2.227 3824	3.508 8213
35	2.843 6215	3.976 3000	5.054 0497	0.829 3516	2.208 5706	3.485 4889
36	2.813 8380	3.943 0634	5.016 1308	0.811 8710	2.190 0438	3.461 9056
37	2.783 9250	3.909 5508	4.977 7822	0.794 2520	2.171 4716	3.438 0385
38	2.753 8790	3.875 7482	4.938 9845	0.776 4993	2.152 8578	3.413 8702
39	2.723 6963	3.841 6400	4.899 7169	0.773 0952	2.134 2061	3.389 3819
40	2.693 2014	3.807 2096	4.859 9580	0.782 0034	2.114 8727	3.364 5527
41	2.662 2105	3.772 4530	4.819 6846	0.776 0028	2.094 2093	3.339 3978
42	2.630 8806	3.737 3810	4.778 8716	0.763 1061	2.072 8184	3.313 9737
43	2.599 2876	3.701 9928	4.737 4886	0.737 8002	2.050 9942	3.288 3051
44	2.567 6021	3.666 2810	4.695 5018	0.712 4944	2.029 3485	3.262 4014
45	2.535 8217	3.630 2222	4.652 8730	0.681 0282	2.007 8893	3.236 2349
46	2.504 0364	3.593 7912	4.609 5608	0.649 4734	1.986 9308	3.209 7742
47	2.472 2477	3.556 9513	4.565 5208	0.611 3932	1.966 4895	3.182 9654
48	2.440 5529	3.519 6612	4.520 7050	0.559 3531	1.946 8805	3.155 7480
49	2.409 1527	3.481 8662	4.475 0634	0.520 0365	1.928 7125	3.128 0340
50	2.377 8632	3.443 4847	4.428 5432	0.480 2529	1.911 4253	3.099 6834
51	2.346 6904	3.404 4422	4.381 0936	0.476 4867	1.895 0275	3.070 5764
52	2.315 1327	3.364 6521	4.332 6626	0.471 7025	1.878 1362	3.040 5743

TABLE XXVI.

LOGARITHMS OF COMMUTATION TABLES FOR SINGLE LIVES.

AGE.	λD_x	λN_x	λS_x	λC_x	λM_x	λR_x
53	2.283 1743	3.324 0636	4.283 2008	0.465 9922	1.860 7578	3.009 6196
54	2.250 7982	3.282 6207	4.232 6561	0.453 2754	1.842 8963	2.977 6443
55	2.218 0918	3.240 2591	4.180 9751	0.446 1944	1.824 8174	2.944 5717
56	2.184 9315	3.196 8962	4.128 1015	0.438 3793	1.806 2648	2.910 2903
57	2.151 2947	3.152 4482	4.073 9814	0.446 0737	1.787 2375	2.874 6914
58	2.116 8172	3.106 8186	4.018 5616	0.475 4368	1.766 9741	2.837 6472
59	2.080 8693	3.059 9358	3.961 7917	0.506 9540	1.744 1922	2.799 0768
60	2.043 1073	3.011 7890	3.903 6231	0.542 7020	1.718 2841	2.759 0105
61	2.003 0082	2.962 4080	3.843 9991	0.531 4069	1.688 2845	2.717 5512
62	1.961 8762	2.911 8959	3.782 8470	0.509 5342	1.656 9158	2.674 9270
63	1.920 0125	2.860 2126	3.720 0634	0.477 3346	1.624 8273	2.631 1255
64	1.877 7690	2.807 2724	3.655 5274	0.452 0288	1.592 7475	2.586 0623
65	1.834 8380	2.752 9259	3.589 1046	0.423 2346	1.560 1439	2.539 5554
66	1.791 3114	2.697 0350	3.520 6532	0.394 4121	1.527 2419	2.491 4489
67	1.747 1435	2.639 4180	3.450 0207	0.369 1063	1.494 0172	2.441 5260
68	1.702 1192	2.579 8587	3.377 0488	0.343 8004	1.460 1567	2.389 5245
69	1.656 1567	2.518 1213	3.301 5770	0.322 0111	1.425 5950	2.335 1599
70	1.608 9816	2.453 9231	3.223 4492	0.296 7053	1.389 9584	2.278 0851
71	1.560 6466	2.386 9501	3.142 5221	0.305 0825	1.353 4268	2.217 9131
72	1.508 9999	2.316 7903	3.058 6807	0.317 0247	1.312 7233	2.154 1149
73	1.453 0499	2.243 3017	2.971 8692	0.320 4906	1.266 4853	2.086 5474
74	1.392 4198	2.166 5006	2.882 0538	0.322 1682	1.214 2906	2.015 2839
75	1.326 0749	2.086 5007	2.789 1925	0.280 8742	1.154 7087	1.940 5304
76	1.257 1668	2.003 6858	2.693 2079	0.244 5730	1.092 3718	1.862 8671
77	1.184 6679	1.917 8919	2.593 9035	0.190 4954	1.025 8738	1.782 1383
78	1.110 0033	1.829 1394	2.491 0591	0.121 4105	0.957 2856	1.698 4442
79	1.034 6623	1.737 1279	2.384 3706	0.082 7408	0.888 7824	1.611 4707
80	0.954 6237	1.641 0873	2.273 5054	0.014 6829	0.814 9707	1.520 2932
81	0.872 9504	1.540 9937	2.158 2319	9.974 1370	0.740 0844	1.424 9569
82	0.785 2570	1.435 9951	2.038 2369	9.908 2134	0.658 4208	1.324 4500
83	0.694 1012	1.326 1413	1.913 3590	9.847 4352	0.573 4282	1.218 8990
84	0.597 7630	1.210 7529	1.783 3580	9.773 2808	0.483 0193	1.107 5169
85	0.497 3615	1.089 3971	1.648 1397	9.715 7902	0.388 7602	0.989 8070
86	0.388 3617	0.961 0648	1.507 7454	9.649 6480	0.285 0994	0.864 5300
87	0.269 6814	0.825 8823	1.362 6579	9.579 2639	0.170 7439	0.731 7783
88	0.138 5719	0.684 5140	1.213 5783	9.455 3482	0.042 2206	0.592 2553
89	0.005 4566	0.539 1334	1.061 3005	9.313 5367	9.912 0989	0.448 4913
90	9.874 7604	0.388 7782	0.906 0934	9.265 3680	9.785 9880	0.299 2544
91	9.718 3556	0.230 0226	0.748 7852	9.148 9817	9.630 1144	0.140 1670
92	9.546 9217	0.070 2256	0.592 1070	8.968 7738	9.456 0151	9.979 6500
93	9.378 9483	9.915 5060	0.436 7768	8.767 3767	9.284 8969	9.825 0716
94	9.223 3087	9.766 3371	0.281 1841	8.595 9428	9.127 6781	9.677 3766
95	9.073 0641	9.619 7925	0.122 7940	8.415 7349	8.976 5173	9.533 4803
96	8.932 3647	9.474 7241	9.959 0863	8.244 3011	8.836 8992	9.392 4049
97	8.800 6036	9.327 9108	9.786 5709	8.122 0852	8.708 7599	9.250 7689
98	8.666 1532	9.174 8930	9.600 9460	7.971 8406	8.578 5694	9.103 8147
99	8.536 1120	9.013 7878	9.396 8765	7.770 4435	8.455 1754	8.949 9230
100	8.423 6560	8.837 9736	9.164 8371	7.745 1376	8.354 6308	8.782 3837
101	8.289 2056	8.626 7101	8.888 1899	7.719 8317	8.232 1419	8.579 3308
102	8.117 7717	8.359 3273	8.543 6437	7.694 5259	8.072 6322	8.320 0216
103	7.870 6172	7.989 3662	8.082 5197	7.669 2200	7.837 0389	7.957 7796
104	7.368 1900	7.368 1900	7.368 1900	7.342 8841	7.342 8841	7.342 8841

TABLE XXVII.

LOGARITHMS OF THE PRESENT VALUE OF ANNUITIES OF £1 ON A SINGLE LIFE, PAYABLE YEARLY, FIRST PAYMENT DUE ONE YEAR HENCE, AT THE FOLLOWING RATES OF INTEREST.

AGE.	λa_x 3 per cent.	λa_x 3½ per cent.	λa_x 4 per cent.	λa_x 5 per cent.	λa_x 6 per cent.
0	1.238 5434	1.195 1224	1.154 7780	1.082 1755	1.018 6884
1	1.302 8565	1.259 3749	1.218 9176	1.145 9693	1.082 0290
2	1.332 4479	1.289 0455	1.248 6146	1.175 5968	1.111 4710
3	1.355 6995	1.312 4859	1.272 1917	1.199 3242	1.135 2290
4	1.367 0740	1.324 1078	1.284 0095	1.211 4094	1.147 4597
5	1.374 6139	1.331 9384	1.292 0795	1.219 8352	1.156 1177
6	1.377 4108	1.335 0517	1.295 4577	1.223 6197	1.160 1845
7	1.377 7896	1.335 7626	1.296 4498	1.225 0512	1.161 9304
8	1.376 5895	1.334 9052	1.295 8843	1.224 9462	1.162 1604
9	1.374 3278	1.332 9928	1.294 2707	1.223 8068	1.161 3694
10	1.371 2888	1.330 3068	1.291 8880	1.221 9065	1.159 8247
11	1.367 8501	1.327 2240	1.289 1109	1.219 6173	1.157 8960
12	1.364 4136	1.324 1469	1.286 3427	1.217 3429	1.155 9876
13	1.360 9104	1.321 0056	1.283 5133	1.215 0135	1.154 0293
14	1.357 3369	1.317 7971	1.280 6199	1.212 6261	1.152 0187
15	1.353 7620	1.314 5903	1.277 7317	1.210 2507	1.150 0262
16	1.350 3317	1.311 5327	1.274 9968	1.208 0374	1.148 2037
17	1.346 9842	1.308 5626	1.272 3548	1.205 9270	1.146 4939
18	1.343 5799	1.305 5407	1.269 6660	1.203 7806	1.144 7585
19	1.340 0425	1.302 3907	1.266 8545	1.201 5221	1.142 9207
20	1.336 3652	1.299 1057	1.263 9129	1.199 1439	1.140 9736
21	1.332 5401	1.295 6776	1.260 8333	1.196 6377	1.138 9086
22	1.328 4837	1.292 0225	1.257 5312	1.193 9183	1.136 6390
23	1.324 2583	1.288 2022	1.254 0682	1.191 0469	1.134 2263
24	1.319 8541	1.284 2070	1.250 4341	1.188 0128	1.131 6590
25	1.315 2607	1.280 0260	1.246 6182	1.184 8045	1.128 9248
26	1.310 5452	1.275 7264	1.242 6869	1.181 4887	1.126 0907
27	1.305 6226	1.271 2224	1.238 5550	1.177 9787	1.123 0691
28	1.300 6386	1.266 6603	1.234 3683	1.174 4215	1.120 0072
29	1.295 8319	1.262 2800	1.230 3678	1.171 0602	1.117 1513
30	1.291 3009	1.258 1812	1.226 6553	1.168 0000	1.114 6093
31	1.286 6638	1.253 9824	1.222 8493	1.164 8599	1.112 0012
32	1.281 8332	1.249 5962	1.218 8624	1.161 5526	1.109 2401
33	1.276 7137	1.244 9265	1.214 5981	1.157 9807	1.106 2276
34	1.271 2854	1.239 9532	1.210 0354	1.154 1227	1.102 9406
35	1.265 6116	1.234 7392	1.205 2376	1.150 0404	1.099 4419
36	1.259 6761	1.229 2681	1.200 1874	1.145 7168	1.095 7128
37	1.253 5484	1.223 6090	1.194 9545	1.141 2213	1.091 8232
38	1.247 2169	1.217 7506	1.189 5269	1.136 5416	1.087 7610
39	1.240 6691	1.211 6801	1.183 8916	1.131 6650	1.083 5133
40	1.234 0721	1.205 5654	1.178 2181	1.126 7620	1.079 2516
41	1.227 6127	1.199 5943	1.172 6944	1.122 0238	1.075 1705
42	1.221 1272	1.193 6041	1.167 1594	1.117 2908	1.071 1122
43	1.214 5281	1.187 5075	1.161 5264	1.112 4776	1.066 9934
44	1.207 6211	1.181 1108	1.155 6012	1.107 3905	1.062 6201
45	1.200 3832	1.174 3904	1.149 3610	1.102 0061	1.057 9695
46	1.192 6903	1.167 2220	1.142 6795	1.096 1982	1.052 9149
47	1.184 5026	1.159 5648	1.135 5169	1.089 9253	1.047 4135
48	1.175 6738	1.151 2718	1.127 7245	1.083 0368	1.041 3133
49	1.165 9349	1.142 0719	1.119 0288	1.075 2552	1.034 3320
50	1.155 4047	1.132 0820	1.109 5455	1.066 6924	1.026 5790
51	1.144 0040	1.121 2203	1.099 1906	1.057 2606	1.017 9617

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TABLE XXVII.

LOGARITHMS OF THE PRESENT VALUE OF ANNUITIES OF £1 ON A SINGLE LIFE, PAYABLE YEARLY, FIRST PAYMENT DUE ONE YEAR HENCE, AT THE FOLLOWING RATES OF INTEREST.

AGE.	λa_x 3 per cent.	λa_x 3½ per cent.	λa_x 4 per cent.	λa_x 5 per cent.	λa_x 6 per cent.
52	1.132 1861	1.109 9406	1.088 4171	1.047 4115	1.008 9309
53	1.119 9152	1.098 2055	1.077 1872	1.037 1058	0.999 4464
54	1.107 1488	1.085 9728	1.065 4576	1.026 2987	0.989 4609
55	1.093 7265	1.073 0791	1.053 0635	1.014 8226	0.978 8044
56	1.079 6955	1.059 5715	1.040 0507	1.002 7201	0.967 5167
57	1.064 9936	1.045 3855	1.026 3530	0.989 9218	0.955 5239
58	1.049 9179	1.030 8177	1.012 2662	0.976 7215	0.943 1186
59	1.035 0790	1.016 4800	0.998 4035	0.963 7354	0.930 9197
60	1.020 8329	1.002 7316	0.985 1269	0.951 3314	0.919 3007
61	1.007 7714	0.990 1694	0.973 0395	0.940 1238	0.908 8877
62	0.994 5431	0.977 4436	0.960 7921	0.928 7656	0.898 3364
63	0.980 7609	0.964 1665	0.947 9972	0.916 8698	0.887 2599
64	0.965 9332	0.949 8454	0.934 1602	0.903 9387	0.875 1569
65	0.950 2357	0.934 6542	0.919 4542	0.890 1428	0.862 1970
66	0.933 4070	0.918 3300	0.903 6139	0.875 2130	0.848 1066
67	0.915 2929	0.900 7154	0.886 4794	0.858 9840	0.832 7152
68	0.895 8901	0.881 8045	0.868 0419	0.841 4411	0.816 0021
69	0.875 0216	0.861 4158	0.848 1161	0.822 3908	0.797 7664
70	0.852 6761	0.839 5343	0.826 6813	0.801 8036	0.777 9685
71	0.828 4320	0.815 7303	0.803 3020	0.779 2292	0.756 1437
72	0.804 3045	0.792 0190	0.779 9918	0.756 6793	0.734 3018
73	0.781 2855	0.769 3948	0.757 7486	0.735 1571	0.713 4507
74	0.759 8357	0.748 3241	0.737 0432	0.715 1436	0.694 0809
75	0.741 3064	0.730 1688	0.719 2490	0.698 0345	0.677 6109
76	0.722 3796	0.711 6117	0.701 0491	0.680 5139	0.660 7251
77	0.704 0755	0.693 6774	0.683 4726	0.663 6198	0.644 4715
78	0.684 6747	0.674 6453	0.664 7981	0.645 6290	0.627 1246
79	0.661 9774	0.652 3054	0.642 8055	0.624 3014	0.606 4250
80	0.639 9568	0.630 6351	0.621 4762	0.603 6263	0.586 3700
81	0.614 7623	0.605 7729	0.596 9375	0.579 7102	0.563 0447
82	0.590 8018	0.582 1312	0.573 6067	0.556 9785	0.540 8843
83	0.564 8854	0.556 5118	0.548 2774	0.532 2101	0.516 6517
84	0.538 3281	0.530 2254	0.522 2558	0.506 7012	0.491 6341
85	0.509 0986	0.501 2242	0.493 4779	0.478 3557	0.463 7033
86	0.481 8745	0.474 1834	0.466 6164	0.451 8409	0.437 5206
87	0.458 3878	0.450 8379	0.443 4087	0.428 8988	0.414 8326
88	0.443 4151	0.435 9893	0.428 6812	0.414 4049	0.400 5615
89	0.425 6802	0.418 3434	0.411 1213	0.397 0094	0.383 3216
90	0.397 7157	0.390 3695	0.383 1354	0.368 9912	0.355 2622
91	0.394 5536	0.387 1789	0.379 9119	0.365 6905	0.351 8700
92	0.411 1140	0.403 7798	0.396 5465	0.382 3756	0.368 5843
93	0.429 1934	0.421 9985	0.414 8971	0.400 9668	0.387 3888
94	0.437 0581	0.430 0901	0.423 2063	0.409 6858	0.396 4838
95	0.440 4269	0.433 7840	0.427 2152	0.414 2964	0.401 6600
96	0.431 9885	0.425 7576	0.419 5909	0.407 4460	0.395 5461
97	0.408 0049	0.402 2530	0.396 5553	0.385 3190	0.374 2894
98	0.378 0954	0.372 9101	0.367 7688	0.357 6167	0.347 6346
99	0.328 5613	0.324 0249	0.319 5235	0.310 6247	0.301 8616
100	0.225 9697	0.222 0835	0.218 2245	0.210 5868	0.203 0541
101	0.089 2639	0.086 0238	0.082 8038	0.076 4236	0.070 1217
102	9.887 0787	9.884 4625	9.881 8605	9.876 6994	9.871 5945
103	9.510 0414	9.507 9384	9.505 8454	9.501 6892	9.497 5730

TABLE XXVIII.

LOGARITHMS OF THE PRESENT VALUE OF INCREASING ANNUITIES OF £1 PER ANNUM, THE FIRST PAYMENT OF £1 BEING DUE ONE YEAR HENCE, AND THE INCREASE £1 YEARLY.

AGE.	$\lambda I a_x$ 3 per cent.	$\lambda I a_x$ 3½ per cent.	$\lambda I a_x$ 4 per cent.	$\lambda I a_x$ 5 per cent.	$\lambda I a_x$ 6 per cent.
0	2.568 4423	2.494 8170	2.425 0651	2.296 3995	2.180 8438
1	2.633 0488	2.559 9887	2.490 7203	2.362 8035	2.247 7522
2	2.661 5895	2.589 1289	2.520 3810	2.393 2965	2.278 8425
3	2.682 7313	2.610 8933	2.542 6923	2.416 4981	2.302 7060
4	2.691 4178	2.620 2182	2.552 5807	2.427 3145	2.314 2263
5	2.695 8282	2.625 2784	2.558 2170	2.433 9062	2.321 5518
6	2.695 2269	2.625 3347	2.558 8584	2.435 5231	2.323 9240
7	2.692 0209	2.622 7931	2.556 9090	2.434 5651	2.323 7382
8	2.687 1024	2.618 5445	2.553 2587	2.431 9198	2.321 8792
9	2.681 0232	2.613 1400	2.548 4586	2.428 1365	2.318 8951
10	2.674 0930	2.606 8896	2.542 8174	2.423 5239	2.315 0937
11	2.666 7012	2.600 1818	2.536 7242	2.418 4710	2.310 8640
12	2.659 2455	2.593 4155	2.530 5778	2.413 3768	2.306 6055
13	2.651 6546	2.586 5183	2.524 3062	2.408 1697	2.302 2470
14	2.643 9235	2.579 4868	2.517 9054	2.402 8460	2.297 7850
15	2.636 1169	2.572 3841	2.511 4396	2.397 4700	2.293 2845
16	2.628 3691	2.565 3454	2.505 0437	2.392 1769	2.288 8808
17	2.620 6085	2.558 2992	2.498 6462	2.386 8953	2.284 5031
18	2.612 6912	2.551 1016	2.492 1028	2.381 4809	2.280 0067
19	2.604 5395	2.543 6745	2.485 3358	2.375 8560	2.275 3137
20	2.596 1454	2.536 0102	2.478 3369	2.370 0120	2.270 4159
21	2.587 5000	2.528 0989	2.471 0971	2.363 9399	2.265 3040
22	2.578 5223	2.519 8603	2.463 5352	2.357 5583	2.259 8965
23	2.569 2745	2.511 3562	2.455 7134	2.350 9294	2.254 2557
24	2.559 7470	2.502 5773	2.447 6221	2.344 0440	2.248 3725
25	2.549 9301	2.493 5140	2.439 2524	2.336 8926	2.242 2379
26	2.539 8890	2.484 2314	2.430 6685	2.329 5405	2.235 9173
27	2.529 5400	2.474 6455	2.421 7874	2.321 9045	2.229 3280
28	2.519 0235	2.464 8974	2.412 7498	2.314 1261	2.222 6118
29	2.508 5609	2.455 2083	2.403 7773	2.306 4270	2.215 9917
30	2.498 2266	2.445 6529	2.394 9446	2.298 8820	2.209 5421
31	2.487 6316	2.435 8414	2.385 8619	2.291 1012	2.202 8733
32	2.476 6842	2.425 6828	2.376 4378	2.282 9929	2.195 8932
33	2.465 2895	2.415 0815	2.366 5767	2.274 4610	2.188 5054
34	2.453 4289	2.404 0188	2.356 2594	2.265 4861	2.180 6903
35	2.441 1642	2.392 5561	2.345 5475	2.256 1297	2.172 5093
36	2.428 4773	2.380 6756	2.334 4229	2.246 3737	2.163 9442
37	2.415 4330	2.368 4419	2.322 9504	2.236 2821	2.155 0595
38	2.402 0143	2.355 8380	2.311 1124	2.225 8382	2.145 8379
39	2.388 2036	2.342 8457	2.298 8912	2.215 0239	2.136 2617
40	2.374 1530	2.329 6178	2.286 4395	2.203 9913	2.126 4832
41	2.360 0220	2.316 3130	2.273 9155	2.192 8991	2.116 6611
42	2.345 6251	2.302 7459	2.261 1335	2.181 5611	2.106 6080
43	2.330 8554	2.288 8085	2.247 9856	2.169 8676	2.096 2142
44	2.315 5083	2.274 2961	2.234 2657	2.157 6116	2.085 2709
45	2.299 5496	2.259 1733	2.219 9380	2.144 7559	2.073 7391
46	2.282 8495	2.243 3104	2.204 8716	2.131 1675	2.061 4844
47	2.265 3653	2.226 6627	2.189 0212	2.116 7993	2.048 4573
48	2.246 9556	2.209 0881	2.172 2435	2.101 5058	2.034 5105
49	2.227 3733	2.190 3386	2.154 2898	2.085 0365	2.019 3905
50	2.206 7559	2.170 5514	2.135 2961	2.067 5253	2.003 2304
51	2.185 0510	2.149 6729	2.115 2082	2.048 9165	1.985 9722

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TABLE XXVIII.

LOGARITHMS OF THE PRESENT VALUE OF INCREASING ANNUITIES OF £1 PER ANNUM, THE FIRST PAYMENT OF £1 BEING DUE ONE YEAR HENCE, AND THE INCREASE £1 YEARLY.

AGE.	$\lambda I a_x$ 3 per cent.	$\lambda I a_x$ 3½ per cent.	$\lambda I a_x$ 4 per cent.	$\lambda I a_x$ 5 per cent.	$\lambda I a_x$ 6 per cent.
52	2.162 7125	2.128 1568	2.094 4796	2.029 6630	1.968 0681
53	2.139 7082	2.105 9697	2.073 0764	2.009 7297	1.949 4818
54	2.116 0024	2.083 0771	2.050 9634	1.989 0806	1.930 1769
55	2.091 4556	2.059 3375	2.027 9990	1.967 5737	1.910 0097
56	2.066 1366	2.034 8207	2.004 2528	1.945 2779	1.889 0499
57	2.040 0143	2.009 4954	1.979 6937	1.922 1627	1.867 2669
58	2.013 3994	1.983 6726	1.954 6333	1.898 5409	1.844 9745
59	1.986 8673	1.957 9286	1.929 6486	1.874 9911	1.822 7538
60	1.960 7004	1.932 5466	1.905 0234	1.851 7988	1.800 8918
61	1.935 3475	1.907 9753	1.881 2067	1.829 4136	1.779 8388
62	1.909 4069	1.882 8120	1.856 7946	1.806 4294	1.758 1872
63	1.882 4662	1.856 6427	1.831 3720	1.782 4274	1.735 5149
64	1.854 0510	1.828 9910	1.804 4600	1.756 9256	1.711 3356
65	1.824 3398	1.800 0336	1.776 2334	1.730 0943	1.685 8152
66	1.793 1024	1.769 5381	1.746 4574	1.701 6939	1.658 7093
67	1.760 2408	1.737 4037	1.715 0288	1.671 6163	1.629 9053
68	1.725 8248	1.703 6980	1.682 0136	1.639 9224	1.599 4578
69	1.689 7920	1.668 3572	1.647 3450	1.606 5412	1.567 2925
70	1.652 2846	1.631 5216	1.611 1618	1.571 6085	1.533 5405
71	1.613 1368	1.593 0250	1.573 2979	1.534 9571	1.498 0341
72	1.574 4328	1.554 9535	1.535 8413	1.498 6789	1.462 8693
73	1.537 1104	1.518 2482	1.499 7362	1.463 7251	1.429 0039
74	1.501 4842	1.483 2272	1.465 3040	1.430 4233	1.396 7727
75	1.468 4955	1.450 8337	1.433 4905	1.399 7252	1.367 1330
76	1.434 8022	1.417 7248	1.400 9514	1.368 2840	1.336 7367
77	1.401 2215	1.384 7156	1.368 5006	1.336 9107	1.306 3912
78	1.366 0503	1.350 0992	1.334 4261	1.303 8845	1.274 3673
79	1.327 5003	1.312 0810	1.296 9285	1.267 3947	1.238 8431
80	1.289 3800	1.274 4666	1.259 8098	1.231 2372	1.203 6082
81	1.248 3512	1.233 9120	1.219 7197	1.192 0486	1.165 2865
82	1.208 6582	1.194 6575	1.180 8951	1.154 0595	1.128 1020
83	1.167 5468	1.153 9425	1.140 5686	1.114 4876	1.089 2568
84	1.126 6778	1.113 4222	1.100 3898	1.074 9712	1.050 3767
85	1.085 0040	1.072 0453	1.059 3024	1.034 4433	1.010 3839
86	1.047 5160	1.034 8079	1.022 3081	0.997 9145	0.974 2962
87	1.015 9376	1.003 4442	0.991 1516	0.967 1499	0.943 8969
88	0.993 7281	0.981 4293	0.969 3219	0.945 6661	0.922 7286
89	0.970 7198	0.958 5983	0.946 6580	0.923 3062	0.900 6368
90	0.943 2071	0.931 2663	0.919 4934	0.896 4407	0.874 0248
91	0.941 5833	0.929 9025	0.918 3752	0.895 7712	0.873 7514
92	0.955 5997	0.944 3040	0.933 1463	0.911 2370	0.889 8551
93	0.965 1434	0.954 3580	0.943 6954	0.922 7308	0.902 2358
94	0.958 8960	0.948 7310	0.938 6730	0.918 8733	0.899 4853
95	0.941 3233	0.931 8791	0.922 5274	0.904 0969	0.886 0222
96	0.904 8795	0.896 2406	0.887 6804	0.870 7918	0.854 2062
97	0.845 9498	0.838 1874	0.830 4904	0.815 2899	0.800 3424
98	0.770 8420	0.764 0238	0.757 2591	0.743 8879	0.730 7233
99	0.663 0685	0.657 2395	0.651 4530	0.640 0065	0.628 7251
100	0.493 1062	0.488 2631	0.483 4528	0.473 9297	0.464 5339
101	0.277 2939	0.273 4250	0.269 5803	0.261 9623	0.254 4381
102	9.982 0732	9.979 1450	9.976 2333	9.970 4585	9.964 7480
103	9.510 0414	9.507 9384	9.505 8454	9.501 6892	9.497 5730

TABLE XXIX.

LOGARITHMS OF THE PRESENT VALUES OF AN ASSURANCE OF \$1 ON A SINGLE LIFE, PAYABLE AT THE END OF THE YEAR IN WHICH THE LIFE FAILS, AT THE FOLLOWING RATES OF INTEREST.

AGE. (x)	λA_x 3 per cent.	λA_x 3½ per cent.	λA_x 4 per cent.	λA_x 5 per cent.	λA_x 6 per cent.
0	9.668 7707	9.639 7006	9.615 1548	9.576 3401	9.547 1212
1	9.586 4687	9.546 1856	9.511 6492	9.456 3019	9.414 4426
2	9.537 3737	9.488 9215	9.446 7903	9.378 2302	9.325 7706
3	9.491 6495	9.434 2131	9.383 3265	9.298 5110	9.231 9366
4	9.466 3832	9.403 0239	9.346 1027	9.249 3944	9.171 7557
5	9.448 3913	9.380 1507	9.318 0603	9.210 5894	9.122 2287
6	9.441 4397	9.370 5917	9.305 5977	9.191 6951	9.096 4762
7	9.440 4864	9.368 3692	9.301 8494	9.184 2837	9.084 8559
8	9.443 4974	9.371 0482	9.303 9907	9.184 8321	9.083 2968
9	9.449 0935	9.376 9455	9.310 0286	9.190 7343	9.088 6287
10	9.456 4566	9.385 0523	9.318 7542	9.200 3709	9.098 8275
11	9.464 5801	9.394 1145	9.328 6486	9.211 6481	9.111 1852
12	9.472 4856	9.402 9135	9.338 2317	9.222 5129	9.123 0251
13	9.480 3380	9.411 6538	9.347 7518	9.233 3095	9.134 7948
14	9.488 1411	9.420 3402	9.357 2149	9.244 0456	9.146 5048
15	9.495 7473	9.428 7893	9.366 3984	9.254 4137	9.157 7541
16	9.502 8651	9.436 6392	9.374 8645	9.263 8077	9.167 7506
17	9.509 6475	9.444 0793	9.382 8405	9.272 5365	9.176 8880
18	9.516 3864	9.451 4701	9.390 7614	9.281 1953	9.185 9346
19	9.523 2252	9.458 9890	9.398 8415	9.290 0795	9.195 2740
20	9.530 1647	9.466 6381	9.407 0834	9.299 1940	9.204 9147
21	9.537 2062	9.474 4189	9.415 4894	9.308 5433	9.214 8647
22	9.544 4857	9.482 4992	9.424 2621	9.318 4074	9.225 4906
23	9.551 8708	9.490 7162	9.433 2062	9.328 5206	9.236 4509
24	9.559 3622	9.499 0718	9.442 3239	9.338 8870	9.247 7530
25	9.566 9621	9.507 5673	9.451 6175	9.349 5103	9.259 4038
26	9.574 5471	9.516 0520	9.460 9057	9.360 1440	9.271 0860
27	9.582 2416	9.524 6784	9.470 3720	9.371 0388	9.283 1236
28	9.589 8092	9.533 1564	9.479 6686	9.381 7219	9.294 9081
29	9.596 9051	9.541 0633	9.488 2888	9.391 5034	9.305 5489
30	9.603 4195	9.548 2634	9.496 0696	9.400 1575	9.314 7477
31	9.609 9186	9.555 4493	9.503 8373	9.408 8004	9.323 9330
32	9.616 5151	9.562 7592	9.511 7573	9.417 6564	9.333 3935
33	9.623 3204	9.570 3293	9.519 9934	9.426 9487	9.343 4190
34	9.630 3371	9.578 1632	9.528 5495	9.436 6851	9.354 0230
35	9.637 4608	9.586 1337	9.537 2752	9.446 6637	9.364 9491
36	9.644 6935	9.594 2437	9.546 1737	9.456 8901	9.376 2058
37	9.651 9359	9.602 3719	9.555 1009	9.467 1706	9.387 5466
38	9.659 1904	9.610 5217	9.564 0606	9.477 5106	9.398 9788
39	9.666 4599	9.618 6961	9.573 0568	9.487 9159	9.410 5098
40	9.673 5556	9.626 6659	9.581 8172	9.498 0201	9.421 6713
41	9.680 2914	9.634 2050	9.590 0726	9.507 4614	9.431 9988
42	9.686 8531	9.641 5384	9.598 0892	9.516 5931	9.441 9378
43	9.693 3321	9.648 7759	9.605 9969	9.525 5879	9.451 7066
44	9.699 9092	9.656 1370	9.614 0557	9.534 7923	9.461 7464
45	9.706 5870	9.663 6252	9.622 2698	9.544 2136	9.472 0676
46	9.713 4562	9.671 3500	9.630 7691	9.554 0259	9.482 8944
47	9.720 5203	9.679 3162	9.639 5598	9.564 2393	9.494 2418
48	9.727 8668	9.687 6296	9.648 7676	9.575 0226	9.506 3276
49	9.735 6620	9.696 4915	9.658 6304	9.586 6943	9.519 5598
50	9.743 7470	9.705 7103	9.668 9225	9.598 9554	9.533 5621
51	9.752 1226	9.715 2861	9.679 6441	9.611 8075	9.548 3371
52	9.760 4143	9.724 7698	9.690 2665	9.624 5519	9.563 0035

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TABLE XXIX.

LOGARITHMS OF THE PRESENT VALUES OF AN ASSURANCE OF £1 ON A SINGLE LIFE, PAYABLE AT THE END OF THE YEAR IN WHICH THE LIFE FAILS, AT THE FOLLOWING RATES OF INTEREST

AGE. (x)	λA_x 3 per cent.	λA_x 3½ per cent.	λA_x 4 per cent.	λA_x 5 per cent.	λA_x 6 per cent.
53	9.768 6312	9.734 1719	9.700 8028	9.637 2062	9.577 5835
54	9.776 7815	9.743 5025	9.711 2643	9.649 7862	9.592 0981
55	9.784 9418	9.752 8535	9.721 7596	9.662 4341	9.606 7256
56	9.793 0532	9.762 1548	9.732 2062	9.675 0432	9.621 3333
57	9.801 1241	9.771 4164	9.742 6166	9.687 6301	9.635 9428
58	9.808 9761	9.780 4261	9.752 7436	9.699 8744	9.650 1569
59	9.816 3140	9.788 8330	9.762 1791	9.711 2492	9.663 3229
60	9.823 0171	9.796 4949	9.770 7577	9.721 5406	9.675 1768
61	9.828 8872	9.803 1757	9.778 2044	9.730 3932	9.685 2763
62	9.834 5786	9.809 6503	9.785 4186	9.738 9606	9.695 0396
63	9.840 2524	9.816 1095	9.792 6207	9.747 5262	9.704 8148
64	9.846 0807	9.822 7574	9.800 0479	9.756 3953	9.714 9785
65	9.851 9583	9.829 4698	9.807 5563	9.765 3839	9.725 3059
66	9.857 9456	9.836 3181	9.815 2287	9.774 5997	9.735 9305
67	9.864 0506	9.843 3121	9.823 0779	9.784 0589	9.746 8737
68	9.870 2255	9.850 3959	9.831 0386	9.793 6805	9.758 0375
69	9.876 4759	9.857 5769	9.839 1199	9.803 4764	9.769 4383
70	9.882 7528	9.864 7969	9.847 2556	9.813 3638	9.780 9768
71	9.889 1146	9.872 1249	9.855 5253	9.823 4460	9.792 7802
72	9.895 0185	9.878 9245	9.863 1973	9.832 7956	9.803 7234
73	9.900 2856	9.884 9847	9.870 0291	9.841 1070	9.813 4354
74	9.904 8956	9.890 2826	9.875 9929	9.848 3440	9.821 8708
75	9.908 6624	9.894 5974	9.880 8354	9.854 1833	9.828 6338
76	9.912 3164	9.898 7841	9.885 5353	9.859 8537	9.835 2050
77	9.915 6745	9.902 6280	9.889 8460	9.865 0435	9.841 2059
78	9.919 0562	9.906 5028	9.894 1955	9.870 2894	9.847 2823
79	9.922 7949	9.910 7989	9.899 0319	9.876 1578	9.854 1201
80	9.926 2117	9.914 7231	9.903 4471	9.881 5082	9.860 3470
81	9.929 8841	9.918 9506	9.908 2148	9.887 3130	9.867 1340
82	9.933 1582	9.922 7175	9.912 4504	9.892 4759	9.873 1638
83	9.936 4770	9.926 5410	9.916 7760	9.897 7390	9.879 3270
84	9.939 6543	9.930 2046	9.920 9143	9.902 7939	9.885 2563
85	9.942 9098	9.933 9652	9.925 1703	9.908 0115	9.891 3987
86	9.945 7311	9.937 2261	9.928 8622	9.912 5421	9.896 7377
87	9.948 0136	9.939 8645	9.931 8502	9.916 2102	9.901 0625
88	9.949 3998	9.941 4626	9.933 6552	9.918 4148	9.903 6487
89	9.950 9758	9.943 2846	9.935 7195	9.920 9514	9.906 6423
90	9.953 3227	9.946 0117	9.938 8234	9.924 8011	9.911 2276
91	9.953 5779	9.946 3105	9.939 1669	9.925 2362	9.911 7588
92	9.952 2185	9.944 7284	9.937 3636	9.922 9973	9.909 0934
93	9.950 6691	9.942 9138	9.935 2836	9.920 3845	9.905 9486
94	9.949 9728	9.942 0807	9.934 3088	9.919 1144	9.904 3694
95	9.949 6701	9.941 6948	9.933 8310	9.918 4307	9.903 4532
96	9.950 4235	9.942 5292	9.934 7357	9.919 4435	9.904 5345
97	9.952 4781	9.944 8768	9.937 3627	9.922 5921	9.908 1563
98	9.954 8745	9.947 6188	9.940 4357	9.926 2852	9.912 4162
99	9.958 4725	9.951 7616	9.945 1085	9.931 9740	9.919 0634
100	9.964 6684	9.958 9425	9.953 2611	9.942 0316	9.930 9748
101	9.970 8587	9.966 1229	9.961 4202	9.952 1143	9.942 9363
102	9.976 9989	9.973 2513	9.969 5263	9.962 1479	9.954 8605
103	9.982 9257	9.980 1368	9.977 3627	9.971 8622	9.966 4217
104	9.987 1628	9.985 0597	9.982 9667	9.978 8107	9.974 6941

TABLE XXX.

LOGARITHMS OF INCREASING ASSURANCE OF £1 PER ANNUM ON A SINGLE LIFE,
PAYABLE AT THE END OF THE YEAR IN WHICH THE LIFE FAILS.

AGE. (x)	$\lambda I A_x$ 8 per cent.	$\lambda I A_x$ 8½ per cent.	$\lambda I A_x$ 4 per cent.	$\lambda I A_x$ 5 per cent.	$\lambda I A_x$ 6 per cent.
0	0.845 3192	0.743 6127	0.649 2177	0.482 4759	0.344 0364
1	0.900 8043	0.795 5227	0.696 6968	0.518 6850	0.366 3969
2	0.928 5521	0.821 7857	0.720 8976	0.537 0239	0.376 7611
3	0.952 5270	0.845 2127	0.743 3407	0.556 1382	0.390 7732
4	0.966 8693	0.859 7595	0.757 7902	0.569 4412	0.401 6562
5	0.978 4236	0.871 9127	0.770 3149	0.581 9891	0.413 2550
6	0.986 0528	0.880 4271	0.779 5426	0.592 1089	0.423 5526
7	0.991 6844	0.887 0969	0.787 1101	0.601 0394	0.433 2781
8	0.995 9774	0.892 5168	0.793 5350	0.609 1034	0.442 5010
9	0.999 3371	0.897 0518	0.799 1340	0.616 4940	0.451 2536
10	1.001 9783	0.900 8907	0.804 0643	0.623 2886	0.459 5077
11	1.004 2230	0.904 3372	0.808 6079	0.629 7132	0.467 4147
12	1.006 4390	0.907 7505	0.813 1140	0.636 0910	0.475 2624
13	1.008 5628	0.911 0693	0.817 5236	0.642 3678	0.483 0035
14	1.010 5925	0.914 2916	0.821 8348	0.648 5423	0.490 6362
15	1.012 5943	0.917 4836	0.826 1132	0.654 6796	0.498 2260
16	1.014 7122	0.920 7912	0.830 5073	0.660 9339	0.505 9322
17	1.016 8986	0.924 1717	0.834 9805	0.667 2836	0.513 7547
18	1.019 0284	0.927 5044	0.839 4163	0.673 6236	0.521 6042
19	1.021 0306	0.930 7181	0.843 7449	0.679 8875	0.529 4167
20	1.022 8961	0.933 8038	0.847 9560	0.686 0613	0.537 1766
21	1.024 6158	0.936 7507	0.852 0379	0.692 1318	0.544 8667
22	1.026 1072	0.939 4758	0.855 9061	0.698 0110	0.552 3956
23	1.027 4238	0.942 0297	0.859 6079	0.703 7386	0.559 7934
24	1.028 5533	0.944 3985	0.863 1286	0.709 2957	0.567 0358
25	1.029 4828	0.946 5681	0.866 4518	0.714 6620	0.574 0966
26	1.030 2727	0.948 5973	0.869 6344	0.719 8893	0.581 0216
27	1.030 8415	0.950 4045	0.872 5946	0.724 8950	0.587 7266
28	1.031 3244	0.952 1229	0.875 4633	0.729 8046	0.594 3300
29	1.031 9514	0.953 9830	0.878 4727	0.734 8526	0.601 0691
30	1.032 8285	0.956 0972	0.881 7404	0.740 1719	0.608 0959
31	1.033 6100	0.958 1261	0.884 9361	0.745 4527	0.615 1272
32	1.034 2141	0.959 9893	0.887 9797	0.750 6171	0.622 0879
33	1.034 5486	0.961 5929	0.890 7775	0.755 5691	0.628 8803
34	1.034 5892	0.962 9113	0.893 2999	0.760 2741	0.635 4619
35	1.034 3909	0.963 9964	0.895 5971	0.764 7744	0.641 8674
36	1.033 9347	0.964 8288	0.897 6473	0.769 0457	0.648 0676
37	1.033 2840	0.965 4696	0.899 5108	0.773 1435	0.654 1135
38	1.032 4274	0.965 9068	0.901 1753	0.777 0550	0.659 9912
39	1.031 3523	0.966 1285	0.902 6277	0.780 7665	0.665 6856
40	1.030 2168	0.966 2916	0.904 0252	0.784 4336	0.671 3513
41	1.029 2019	0.966 5799	0.905 5536	0.788 2484	0.677 1873
42	1.028 1663	0.966 8564	0.907 0821	0.792 0934	0.683 0931
43	1.027 0345	0.967 0492	0.908 5412	0.795 9073	0.689 0175
44	1.025 6283	0.966 9815	0.909 7572	0.799 5217	0.694 7993
45	1.023 9253	0.966 6305	0.910 7066	0.802 9120	0.700 4132
46	1.021 8070	0.965 8776	0.911 2699	0.805 9577	0.705 7378
47	1.019 2326	0.964 6795	0.911 4017	0.808 6089	0.710 7177
48	1.016 0599	0.962 8919	0.910 9557	0.810 7136	0.715 1951
49	1.012 0290	0.960 2506	0.909 6632	0.811 9939	0.718 8813
50	1.007 2355	0.956 8453	0.907 6059	0.812 5140	0.721 8202
51	1.001 5948	0.952 5843	0.904 6867	0.812 1636	0.723 8860
52	0.995 5166	0.947 8720	0.901 3029	0.811 3238	0.725 4416

MORTALITY.

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TABLE XXX.

LOGARITHMS OF INCREASING ASSURANCE OF £1 PER ANNUM ON A SINGLE LIFE,
PAYABLE AT THE END OF THE YEAR IN WHICH THE LIFE FAILS.

Age. (x)	$\lambda I A_x$ 3 per cent.	$\lambda I A_x$ 3½ per cent.	$\lambda I A_x$ 4 per cent.	$\lambda I A_x$ 5 per cent.	$\lambda I A_x$ 6 per cent.
53	0.988 9665	0.942 6726	0.897 4172	0.809 9554	0.726 4453
54	0.981 9050	0.936 9450	0.892 9871	0.808 0120	0.726 8461
55	0.974 1810	0.930 5359	0.887 8572	0.805 3340	0.726 4799
56	0.965 8335	0.923 4809	0.882 0589	0.801 9436	0.725 3588
57	0.956 8009	0.915 7150	0.875 5238	0.797 7644	0.723 3967
58	0.947 3509	0.907 5011	0.868 5102	0.793 0440	0.720 8300
59	0.938 0435	0.899 3979	0.861 5751	0.788 3364	0.718 2075
60	0.929 2174	0.891 7497	0.855 0680	0.784 0024	0.715 9032
61	0.921 4341	0.885 1268	0.849 5692	0.780 6439	0.714 5430
62	0.913 5039	0.878 3558	0.843 9226	0.777 1428	0.713 0508
63	0.905 0870	0.871 1004	0.837 7957	0.773 1749	0.711 1130
64	0.895 7453	0.862 9223	0.830 7503	0.768 3029	0.708 2933
65	0.885 6335	0.853 9723	0.822 9327	0.762 6630	0.704 7174
66	0.874 5195	0.844 0148	0.814 1045	0.756 0121	0.700 1375
67	0.862 2644	0.832 9067	0.804 1173	0.748 1907	0.694 3825
68	0.848 8636	0.820 6361	0.792 9528	0.739 1664	0.687 4053
69	0.834 1602	0.807 0395	0.780 4399	0.728 7527	0.679 0032
70	0.818 1424	0.792 0955	0.766 5471	0.716 8983	0.669 1035
71	0.800 4412	0.775 4236	0.750 8836	0.703 1882	0.657 2665
72	0.782 7913	0.758 7430	0.735 1498	0.689 2861	0.645 1150
73	0.766 0475	0.742 9065	0.720 1992	0.676 0428	0.633 4975
74	0.750 6127	0.728 3255	0.706 4496	0.663 8926	0.622 8641
75	0.737 6453	0.716 1709	0.695 0862	0.654 0475	0.614 4555
76	0.724 3930	0.703 7190	0.683 4139	0.643 8732	0.605 7003
77	0.711 7202	0.691 8351	0.672 2992	0.634 2384	0.597 4704
78	0.698 2270	0.679 1309	0.660 3653	0.623 7917	0.588 4409
79	0.682 1217	0.663 8120	0.645 8161	0.610 7323	0.576 8084
80	0.666 6457	0.649 0969	0.631 8460	0.598 2076	0.565 6695
81	0.648 7159	0.631 9121	0.615 3927	0.583 1758	0.552 0065
82	0.631 8572	0.615 7586	0.599 9315	0.569 0624	0.539 1930
83	0.613 5669	0.598 1441	0.582 9818	0.553 4107	0.524 7978
84	0.594 8795	0.580 0865	0.565 5451	0.537 1878	0.509 7539
85	0.574 2415	0.560 0221	0.546 0462	0.518 7985	0.492 4455
86	0.555 1684	0.541 4306	0.527 9299	0.501 6135	0.476 1683
87	0.538 8727	0.525 5191	0.512 3968	0.486 8210	0.462 0969
88	0.528 7761	0.515 7154	0.502 8806	0.477 8649	0.453 6834
89	0.516 6516	0.503 8471	0.491 2638	0.466 7390	0.443 0347
90	0.497 1019	0.484 4761	0.472 0661	0.447 8764	0.424 4940
91	0.494 7944	0.482 1253	0.469 6639	0.445 3471	0.421 8114
92	0.506 4859	0.493 7200	0.481 1477	0.456 5705	0.432 7283
93	0.519 8760	0.507 1537	0.494 6069	0.470 0294	0.446 1233
94	0.526 5809	0.514 1133	0.501 8011	0.477 6354	0.454 0679
95	0.530 5913	0.518 5647	0.506 6720	0.483 2844	0.460 4162
96	0.526 6022	0.515 2276	0.503 9670	0.481 7827	0.460 0402
97	0.511 9744	0.501 4389	0.490 9981	0.470 3978	0.450 1653
98	0.493 8491	0.484 2948	0.474 8167	0.456 0896	0.437 6615
99	0.463 2395	0.454 8497	0.446 5211	0.430 0470	0.413 8110
100	0.400 3255	0.393 2726	0.386 2679	0.372 4038	0.358 7277
101	0.323 8980	0.318 1780	0.312 4946	0.301 2386	0.290 1252
102	0.228 2748	0.223 8720	0.219 4949	0.210 8211	0.202 2499
103	0.105 7303	0.102 5929	0.099 4722	0.093 2840	0.087 1624
104	9.987 1628	9.985 0597	9.982 9667	9.978 8107	9.974 6941

TABLE XXXI.

LOGARITHMS OF ANNUAL PREMIUM FOR ASSURANCE OF \$1 ON A SINGLE LIFE,
AT THE END OF THE YEAR IN WHICH THE LIFE FAILS.

AGE. (x)	Log. Annual Premium, A_x 3 per cent.	Log. Annual Premium, A_x 3½ per cent.	Log. Annual Premium, A_x 4 per cent.	Log. Annual Premium, A_x 5 per cent.	Log. Annual Premium, A_x 6 per cent.
0	8.405 8494	8.417 7147	8.430 9849	8.459 6321	8.488 7062
1	8.262 5098	8.263 5446	8.267 2596	8.280 3588	8.297 8700
2	8.185 1821	8.178 1083	8.174 3414	8.174 5737	8.181 9379
3	8.117 2138	8.101 0768	8.088 5281	8.072 5744	8.066 0092
4	8.081 0471	8.058 7982	8.040 0782	8.012 0815	7.994 4214
5	8.055 8235	8.028 4460	8.004 3609	7.965 3341	7.936 8066
6	8.046 1876	8.015 9119	7.988 6839	7.942 8696	7.907 2516
7	8.044 8709	8.013 0098	7.983 9909	7.934 1073	7.893 9981
8	8.049 0337	8.016 5083	7.986 6707	7.934 7547	7.892 2237
9	8.056 8002	8.024 2334	7.994 2443	7.941 7322	7.898 2958
10	8.067 0787	8.034 9062	8.005 2373	7.953 1619	7.909 9393
11	8.078 5000	8.046 9134	8.017 7733	7.966 5983	7.924 1007
12	8.089 6998	8.058 6506	8.029 9889	7.979 6078	7.937 7247
13	8.100 9103	8.070 3897	8.042 1989	7.992 6004	7.951 3245
14	8.112 1370	8.082 1377	8.054 4117	8.005 5863	7.964 9131
15	8.123 1670	8.093 6458	8.066 3391	8.018 1922	7.978 0234
16	8.133 5691	8.104 4117	8.077 4027	8.029 6709	7.989 7218
17	8.143 5555	8.114 6832	8.087 8872	8.040 3867	8.000 4553
18	8.153 5517	8.124 9538	8.098 3600	8.051 0657	8.011 1215
19	8.163 7737	8.135 4737	8.109 1079	8.062 0753	8.022 1754
20	8.174 2293	8.146 2513	8.120 1398	8.073 4269	8.033 6324
21	8.184 9265	8.157 2956	8.131 4659	8.085 1328	8.045 5079
22	8.196 0814	8.168 8542	8.143 3684	8.097 5534	8.058 2492
23	8.207 5016	8.180 7052	8.155 5935	8.110 3648	8.071 4578
24	8.219 1970	8.192 8595	8.168 1527	8.123 5811	8.085 1511
25	8.231 1792	8.205 3284	8.181 0584	8.137 2166	8.099 3474
26	8.243 2610	8.217 8974	8.194 0660	8.150 9620	8.113 6671
27	8.255 6473	8.230 7999	8.207 4399	8.165 1490	8.128 5152
28	8.267 9627	8.243 6069	8.220 6936	8.179 1672	8.143 1465
29	8.279 6349	8.255 6683	8.233 0928	8.192 0982	8.156 4414
30	8.290 4611	8.266 7537	8.244 3791	8.203 6187	8.168 0012
31	8.301 3705	8.277 9179	8.255 7388	8.215 2012	8.179 6080
32	8.312 5589	8.289 3812	8.267 4194	8.227 1520	8.191 6312
33	8.324 2281	8.301 3709	8.279 6758	8.239 7849	8.204 4511
34	8.336 3989	8.313 9090	8.292 5308	8.253 1278	8.218 1023
35	8.348 9061	8.326 8082	8.305 7744	8.266 9197	8.232 2706
36	8.361 7670	8.340 0864	8.319 4251	8.281 1827	8.246 9804
37	8.374 8155	8.353 5564	8.333 2730	8.295 6574	8.261 9208
38	8.388 0647	8.367 2322	8.347 3327	8.310 3599	8.277 1096
39	8.401 5288	8.381 1283	8.361 6197	8.325 3081	8.292 5661
40	8.414 8603	8.394 8564	8.375 7032	8.339 9768	8.307 6631
41	8.427 6971	8.408 0143	8.389 1362	8.353 8251	8.321 7563
42	8.440 3791	8.420 9796	8.402 3373	8.367 3559	8.335 4374
43	8.453 0805	8.433 9444	8.415 5171	8.380 8207	8.349 0014
44	8.466 1643	8.447 3095	8.429 1164	8.394 7458	8.363 0675
45	8.479 6541	8.461 0995	8.443 1606	8.409 1592	8.377 6671
46	8.493 7564	8.475 5398	8.457 8954	8.424 3511	8.393 1396
47	8.508 5099	8.490 6711	8.473 3642	8.440 3690	8.409 5382
48	8.524 1381	8.506 7355	8.489 8284	8.457 5191	8.427 2193
49	8.541 0566	8.524 1850	8.507 7782	8.476 3738	8.446 8463
50	8.558 9913	8.542 7144	8.526 8767	8.496 5273	8.467 9406
51	8.578 0136	8.562 3968	8.547 1983	8.518 0588	8.490 5853
52	8.597 3213	8.582 3573	8.567 7908	8.539 8502	8.513 4841

TABLE XXXI.

LOGARITHMS OF ANNUAL PREMIUM FOR ASSURANCE OF \$1 ON A SINGLE LIFE,
PAYABLE AT THE END OF THE YEAR IN WHICH THE LIFE FAILS.

AGE. (x)	Log. Annual Premium, A_x 3 per cent.	Log. Annual Premium, A_x $3\frac{1}{2}$ per cent.	Log. Annual Premium, A_x 4 per cent.	Log. Annual Premium, A_x 5 per cent.	Log. Annual Premium, A_x 6 per cent.
53	8.616 9554	8.602 6385	8.588 6998	8.561 9529	8.536 6942
54	8.636 9588	8.623 2863	8.609 9735	8.584 4209	8.560 2756
55	8.657 5552	8.644 5399	8.631 8681	8.607 5456	8.584 5583
56	8.678 6351	8.666 2809	8.654 2550	8.631 1769	8.609 3686
57	8.700 2604	8.688 5736	8.677 2016	8.655 3897	8.634 7893
58	8.721 9737	8.710 9286	8.700 1856	8.679 5917	8.660 1555
59	8.742 9168	8.732 4330	8.722 2376	8.702 6964	8.684 2564
60	8.762 6447	8.752 6183	8.742 8646	8.724 1597	8.706 4951
61	8.780 4239	8.770 7106	8.761 2510	8.743 0793	8.725 8765
62	8.798 1438	8.788 7143	8.779 5196	8.761 8213	8.745 0199
63	8.816 3142	8.807 1678	8.798 2374	8.781 0135	8.764 6147
64	8.835 5450	8.826 7129	8.818 0798	8.801 3986	8.785 4751
65	8.855 5627	8.847 0589	8.838 7375	8.822 6307	8.807 2180
66	8.876 6520	8.868 5028	8.860 5205	8.845 0469	8.830 2069
67	8.898 9443	8.891 1798	8.883 5687	8.868 7946	8.854 5992
68	8.922 3769	8.915 0216	8.907 8073	8.893 7887	8.880 2980
69	8.947 0920	8.940 1755	8.933 3881	8.920 1894	8.907 4737
70	8.973 0248	8.966 5715	8.960 2369	8.947 9145	8.936 0353
71	9.000 5720	8.994 6211	8.988 7815	8.977 4239	8.966 4767
72	9.027 4085	9.021 9130	9.016 5212	9.006 0363	8.995 9330
73	9.052 4998	9.047 3813	9.042 3598	9.032 5943	9.023 1836
74	9.075 4486	9.070 6231	9.065 8867	9.056 6733	9.047 7900
75	9.094 9504	9.090 2940	9.085 7199	9.076 8114	9.068 2080
76	9.114 5706	9.110 0727	9.105 6507	9.097 0277	9.088 6860
77	9.133 2646	9.128 8829	9.124 5705	9.116 1472	9.107 9819
78	9.152 7848	9.148 5263	9.144 3308	9.136 1216	9.128 1462
79	9.175 2478	9.171 1782	9.167 1654	9.159 3044	9.151 6545
80	9.196 6643	9.192 7445	9.188 8755	9.181 2847	9.173 8834
81	9.220 7227	9.217 0078	9.213 3378	9.206 1300	9.199 0907
82	9.243 1712	9.239 6167	9.236 1021	9.229 1889	9.222 4257
83	9.266 9879	9.263 6195	9.260 2859	9.253 7212	9.247 2869
84	9.290 8994	9.287 7201	9.284 5713	9.278 3622	9.272 2664
85	9.316 6488	9.313 7038	9.310 7855	9.305 0253	9.299 3631
86	9.340 1014	9.337 3676	9.334 6570	9.329 3032	9.324 0346
87	9.359 9275	9.357 3664	9.354 8261	9.349 8056	9.344 8616
88	9.372 3710	9.369 8806	9.367 4094	9.362 5230	9.357 7066
89	9.386 9141	9.384 5456	9.382 1956	9.377 5478	9.372 9655
90	9.409 4150	9.407 3376	9.405 2785	9.401 2121	9.397 2098
91	9.411 9260	9.409 9017	9.407 8991	9.403 9567	9.400 0918
92	9.398 6996	9.396 4811	9.394 2904	9.389 9895	9.385 7895
93	9.384 0504	9.381 5262	9.379 0362	9.374 1521	9.369 3909
94	9.377 6084	9.374 8080	9.372 0446	9.366 6245	9.361 3410
95	9.374 8361	9.371 7257	9.368 6527	9.362 6169	9.356 7248
96	9.381 7658	9.378 4113	9.375 0936	9.368 5643	9.362 1751
97	9.401 1971	9.397 7236	9.394 2832	9.387 5015	9.380 8491
98	9.424 8879	9.421 2809	9.417 7025	9.410 6324	9.403 6764
99	9.462 8046	9.459 1759	9.455 5711	9.448 4327	9.441 3876
100	9.536 1196	9.532 8270	9.529 5541	9.523 0674	9.516 6572
101	9.622 9073	9.619 9546	9.617 0178	9.611 1937	9.605 4318
102	9.728 7698	9.726 1591	9.723 5612	9.718 4070	9.713 3049
103	9.861 1611	9.858 8853	9.856 6202	9.852 1248	9.847 6727
104	9.987 1628	9.985 0597	9.982 9667	9.978 8107	9.974 6941

TABLE XXXII.

LOGARITHMS OF ANNUAL PREMIUMS FOR AN INCREASING ASSURANCE OF \$1
PER ANNUM ON A SINGLE LIFE, PAYABLE AT THE END OF THE YEAR IN
WHICH THE LIFE FAILS.

Age. (x)	Log. Annual Premium, I A _x 3 per cent.	Log. Annual Premium, I A _x 3½ per cent.	Log. Annual Premium, I A _x 4 per cent.	Log. Annual Premium, I A _x 5 per cent.	Log. Annual Premium, I A _x 6 per cent.
0	9.582 3979	9.521 6268	9.465 0478	9.365 7679	9.285 6214
1	9.576 8454	9.512 8817	9.452 3072	9.342 7419	9.249 8243
2	9.576 3605	9.510 9725	9.448 4487	9.333 3674	9.232 9284
3	9.578 0913	9.512 0764	9.448 5423	9.330 2016	9.224 8458
4	9.581 5332	9.515 5338	9.451 7657	9.332 1283	9.224 3219
5	9.585 8558	9.520 2080	9.456 6155	9.336 7338	9.227 8329
6	9.590 8007	9.525 7473	9.462 6288	9.343 2834	9.234 3280
7	9.596 0689	9.531 7375	9.469 2516	9.350 8630	9.242 4203
8	9.601 5137	9.537 9769	9.476 2150	9.359 0260	9.251 4279
9	9.607 0438	9.544 3397	9.483 3497	9.367 4919	9.260 9207
10	9.612 6004	9.550 7446	9.490 5474	9.376 0796	9.270 6195
11	9.618 1429	9.557 1361	9.497 7326	9.384 6634	9.280 3302
12	9.623 6532	9.563 4876	9.504 8712	9.393 1859	9.289 9620
13	9.629 1351	9.569 8052	9.511 9707	9.401 6587	9.299 5332
14	9.634 5884	9.576 0891	9.519 0316	9.410 0830	9.309 0445
15	9.640 0140	9.582 3401	9.526 0539	9.418 4581	9.318 4953
16	9.645 4162	9.588 5637	9.533 0455	9.426 7971	9.327 9034
17	9.650 8066	9.594 7756	9.540 0272	9.435 1338	9.337 3220
18	9.656 1937	9.600 9881	9.547 0149	9.443 4940	9.346 7911
19	9.661 5791	9.607 2028	9.554 0113	9.451 8833	9.356 3181
20	9.666 9607	9.613 4170	9.561 0124	9.460 2942	9.365 8943
21	9.672 3361	9.619 6274	9.568 0144	9.468 7213	9.375 5099
22	9.677 7029	9.625 8308	9.575 0124	9.477 1570	9.385 1542
23	9.683 0546	9.632 0187	9.581 9952	9.485 5828	9.394 8003
24	9.688 3881	9.638 1862	9.588 9574	9.493 9898	9.404 4339
25	9.693 6999	9.644 3292	9.595 8927	9.502 3683	9.414 0402
26	9.698 9866	9.650 4427	9.602 7947	9.510 7073	9.423 6027
27	9.704 2472	9.656 5260	9.609 6625	9.519 0052	9.433 1182
28	9.709 4779	9.662 5734	9.616 4883	9.527 2499	9.442 5684
29	9.714 6812	9.668 5880	9.623 2767	9.535 4474	9.451 9616
30	9.719 8701	9.674 5875	9.630 0499	9.543 6331	9.461 3494
31	9.725 0619	9.680 5947	9.636 8376	9.551 8535	9.470 8022
32	9.730 2579	9.686 6113	9.643 6418	9.560 1127	9.480 3256
33	9.735 4563	9.692 6345	9.650 4599	9.568 4053	9.489 9124
34	9.740 6510	9.698 6571	9.657 2812	9.576 7168	9.499 5412
35	9.745 8362	9.704 6709	9.664 0963	9.585 0304	9.509 1889
36	9.751 0082	9.710 6715	9.670 8987	9.593 3383	9.518 8422
37	9.756 1636	9.716 6541	9.677 6829	9.601 6303	9.528 4877
38	9.761 3017	9.722 6173	9.684 4474	9.609 9043	9.538 1220
39	9.766 4212	9.728 5607	9.691 1906	9.618 1587	9.547 7419
40	9.771 5215	9.734 4821	9.697 9112	9.626 3903	9.557 3431
41	9.776 6076	9.740 3892	9.704 6172	9.634 6121	9.566 9448
42	9.781 6923	9.746 2976	9.711 3302	9.642 8562	9.576 5927
43	9.786 7829	9.752 2177	9.718 0614	9.651 1401	9.586 3123
44	9.791 8834	9.758 1540	9.724 8179	9.659 4752	9.596 1204
45	9.796 9924	9.764 1048	9.731 5974	9.667 8576	9.606 0127
46	9.802 1072	9.770 0674	9.738 3962	9.676 2829	9.615 9830
47	9.807 2222	9.776 0344	9.745 2061	9.684 7386	9.626 0141
48	9.812 3312	9.781 9978	9.752 0165	9.693 2101	9.636 0868
49	9.817 4236	9.787 9441	9.758 8110	9.701 6734	9.646 1678
50	9.822 4798	9.793 8494	9.765 5601	9.710 0859	9.656 1987
51	9.827 4858	9.799 6950	9.772 2409	9.718 4149	9.666 1342
52	9.832 4236	9.805 4595	9.778 8272	9.726 6221	9.675 9222

MORTALITY.

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TABLE XXXII.

LOGARITHMS OF ANNUAL PREMIUMS FOR AN INCREASING ASSURANCE OF £1
PER ANNUM ON A SINGLE LIFE, PAYABLE AT THE END OF THE YEAR IN
WHICH THE LIFE FAILS.

AGE. (x)	Log. Annual Premium, 1 A _x 3 per cent.	Log. Annual Premium, 1 A _x 3½ per cent.	Log. Annual Premium, 1 A _x 4 per cent.	Log. Annual Premium, 1 A _x 5 per cent.	Log. Annual Premium, 1 A _x 6 per cent.
53	9.837 2907	9.811 1392	9.785 3142	9.734 7021	9.685 5560
54	9.842 0823	9.816 7288	9.791 6963	9.742 6467	9.695 0236
55	9.846 7944	9.822 2223	9.797 9657	9.750 4455	9.704 3126
56	9.851 4154	9.827 6070	9.804 1077	9.758 0773	9.713 3941
57	9.855 9372	9.832 8722	9.810 1088	9.765 5240	9.722 2432
58	9.860 3485	9.838 0036	9.815 9522	9.772 7613	9.730 8286
59	9.864 6463	9.842 9979	9.821 6336	9.779 7836	9.739 1410
60	9.868 8450	9.847 8731	9.827 1749	9.786 6215	9.747 2215
61	9.872 9708	9.852 6617	9.832 6158	9.793 3300	9.755 1432
62	9.877 0691	9.857 4198	9.838 0236	9.800 0035	9.763 0311
63	9.881 1488	9.862 1587	9.843 4124	9.806 6622	9.770 9129
64	9.885 2096	9.866 8778	9.848 8722	9.813 3062	9.778 7899
65	9.889 2379	9.871 5614	9.854 1139	9.819 9098	9.786 6295
66	9.893 2259	9.876 1995	9.859 3963	9.826 4593	9.794 4139
67	9.897 1581	9.880 7744	9.864 6081	9.832 9264	9.802 1080
68	9.901 0150	9.885 2618	9.869 7215	9.839 2746	9.809 6658
69	9.904 7763	9.889 6381	9.874 7081	9.845 4657	9.817 0386
70	9.908 4144	9.893 8701	9.879 5284	9.851 4490	9.824 1620
71	9.911 8986	9.897 9198	9.884 1398	9.857 1661	9.830 9630
72	9.915 1813	9.901 7315	9.888 4737	9.862 5268	9.837 3246
73	9.918 2617	9.905 3031	9.892 5299	9.867 5301	9.843 2457
74	9.921 1657	9.908 6660	9.896 3434	9.872 2219	9.848 7833
75	9.923 9333	9.911 8675	9.899 9707	9.876 6756	9.854 0297
76	9.926 6472	9.915 0076	9.903 5293	9.881 0472	9.859 1813
77	9.929 3103	9.918 0900	9.907 0237	9.885 3421	9.864 2464
78	9.931 9556	9.921 1544	9.910 5006	9.889 6239	9.869 3048
79	9.934 5746	9.924 1913	9.913 9496	9.893 8789	9.874 3428
80	9.937 0983	9.927 1183	9.917 2744	9.897 9841	9.879 2059
81	9.939 5545	9.929 9693	9.920 5157	9.901 9928	9.883 9632
82	9.941 8702	9.932 6578	9.923 5732	9.905 7754	9.888 4549
83	9.944 0778	9.935 2226	9.926 4917	9.909 3929	9.892 7577
84	9.946 1246	9.937 6020	9.929 2021	9.912 7561	9.896 7640
85	9.947 9805	9.939 7607	9.931 6614	9.915 8123	9.900 4099
86	9.949 5387	9.941 5721	9.933 7247	9.918 3746	9.903 4652
87	9.950 7866	9.943 0210	9.935 3727	9.920 4164	9.905 8960
88	9.951 7473	9.944 1334	9.936 6348	9.921 9731	9.907 7413
89	9.952 5899	9.945 1081	9.937 7399	9.923 3354	9.909 3579
90	9.953 1942	9.945 8020	9.938 5212	9.924 2874	9.910 4762
91	9.953 1425	9.945 7165	9.938 3961	9.924 0676	9.910 1444
92	9.952 9670	9.945 4727	9.938 0745	9.923 5627	9.909 4244
93	9.953 2573	9.945 7661	9.938 3595	9.923 7970	9.909 5656
94	9.954 2165	9.946 8406	9.939 5369	9.925 1455	9.911 0395
95	9.955 7573	9.948 5956	9.941 4937	9.927 4706	9.913 6878
96	9.957 9445	9.951 1097	9.944 3249	9.930 9035	9.917 6808
97	9.960 6934	9.954 2857	9.947 9186	9.935 3072	9.922 8581
98	9.963 8625	9.957 9569	9.952 0835	9.940 4368	9.928 9217
99	9.967 5716	9.962 2640	9.956 9837	9.946 5057	9.936 1352
100	9.971 7767	9.967 1571	9.962 5609	9.953 4396	9.944 4101
101	9.975 9466	9.972 0097	9.968 0922	9.960 3180	9.952 6207
102	9.980 0457	9.976 7798	9.973 5298	9.967 0802	9.960 6943
103	9.983 9657	9.981 3414	9.978 7297	9.973 5466	9.968 4134
104	9.987 1628	9.985 0597	9.982 9667	9.978 8107	9.974 6941

TABLE XXXIII.

LOGARITHMS OF THE PRESENT VALUE OF AN ANNUITY OF \$1 ON A SINGLE LIFE, PAYABLE IN ADVANCE.

AGE. (x)	$\lambda \overline{1 + a_x}$ 8 per cent.	$\lambda \overline{1 + a_x}$ 8½ per cent.	$\lambda \overline{1 + a_x}$ 4 per cent.	$\lambda \overline{1 + a_x}$ 5 per cent.	$\lambda \overline{1 + a_x}$ 6 per cent.
0	1.262 9213	1.221 9859	1.184 1699	1.116 7080	1.058 4150
1	1.323 9589	1.282 6410	1.244 3896	1.175 9431	1.116 5726
2	1.352 1916	1.310 8132	1.272 4489	1.203 6565	1.143 8327
3	1.374 4357	1.333 1363	1.294 7984	1.225 9366	1.165 9274
4	1.385 3361	1.344 2257	1.306 0245	1.237 3129	1.177 3343
5	1.392 5678	1.351 7047	1.313 6994	1.245 2553	1.185 4221
6	1.395 2521	1.354 6798	1.316 9138	1.248 8255	1.189 2246
7	1.395 6155	1.355 3594	1.317 8585	1.250 1764	1.190 8578
8	1.394 4637	1.354 5399	1.317 3200	1.250 0774	1.191 0731
9	1.392 2933	1.352 7121	1.315 7843	1.249 0021	1.190 3329
10	1.389 3779	1.350 1461	1.313 5169	1.247 2090	1.188 8882
11	1.386 0801	1.347 2011	1.310 8753	1.245 0498	1.187 0845
12	1.382 7858	1.344 2629	1.308 2428	1.242 9051	1.185 3004
13	1.379 4277	1.341 2641	1.305 5529	1.240 7091	1.183 4703
14	1.376 0041	1.338 2025	1.302 8032	1.238 4593	1.181 5917
15	1.372 5803	1.335 1435	1.300 0593	1.236 2215	1.179 7307
16	1.369 2966	1.332 2275	1.297 4618	1.234 1368	1.178 0288
17	1.366 0920	1.329 3961	1.294 9533	1.232 1498	1.176 4327
18	1.362 8347	1.326 5163	1.292 4014	1.230 1296	1.174 8131
19	1.359 4515	1.323 5153	1.289 7336	1.228 0042	1.173 0986
20	1.355 9354	1.320 3868	1.286 9436	1.225 7671	1.171 2823
21	1.352 2797	1.317 1233	1.284 0235	1.223 4105	1.169 3568
22	1.348 4043	1.313 6450	1.280 8937	1.220 8540	1.167 2414
23	1.344 3692	1.310 0110	1.277 6127	1.218 1558	1.164 9931
24	1.340 1652	1.306 2123	1.274 1712	1.215 3059	1.162 6019
25	1.335 7829	1.302 2389	1.270 5591	1.212 2937	1.160 0564
26	1.331 2861	1.298 1546	1.266 8397	1.209 1820	1.157 4189
27	1.326 5943	1.293 8785	1.262 9321	1.205 8898	1.154 6084
28	1.321 8465	1.289 5495	1.258 9750	1.202 5547	1.151 7616
29	1.317 2702	1.285 3950	1.255 1960	1.199 4052	1.149 1075
30	1.312 9584	1.281 5097	1.251 6905	1.196 5388	1.146 7465
31	1.308 5481	1.277 5314	1.248 0985	1.193 5992	1.144 3250
32	1.303 9562	1.273 3780	1.244 3379	1.190 5044	1.141 7623
33	1.299 0923	1.268 9584	1.240 3176	1.187 1638	1.138 9679
34	1.293 9382	1.264 2542	1.236 0187	1.183 5573	1.135 9207
35	1.288 5547	1.259 3255	1.231 5008	1.179 7440	1.132 6785
36	1.282 9265	1.254 1573	1.226 7486	1.175 7074	1.129 2254
37	1.277 1204	1.248 8155	1.221 8279	1.171 5132	1.125 6258
38	1.271 1257	1.243 2895	1.216 7279	1.167 1507	1.121 8692
39	1.264 9311	1.237 5678	1.211 4371	1.162 6078	1.117 9437
40	1.258 6953	1.231 8095	1.206 1140	1.158 0433	1.114 0082
41	1.252 5943	1.226 1907	1.200 9364	1.153 6363	1.110 2425
42	1.246 4740	1.220 5588	1.195 7519	1.149 2372	1.106 5004
43	1.240 2516	1.214 8315	1.190 4798	1.144 7672	1.102 7052
44	1.233 7449	1.208 8275	1.184 9393	1.140 0465	1.098 6789
45	1.226 9329	1.202 5257	1.179 1092	1.135 0544	1.094 4005
46	1.219 6998	1.195 8102	1.172 8737	1.129 6748	1.089 7548
47	1.212 0104	1.188 6451	1.166 1956	1.123 8703	1.084 7036
48	1.203 7287	1.180 8941	1.158 9392	1.117 5035	1.079 1083
49	1.194 6054	1.172 3065	1.150 8522	1.110 3205	1.072 7135
50	1.184 7557	1.162 9959	1.142 0458	1.102 4281	1.065 6215
51	1.174 1090	1.152 8893	1.132 4458	1.093 7487	1.057 7518
52	1.163 0930	1.142 4125	1.122 4757	1.084 7017	1.049 5194

$$\lambda N_x - \lambda D_x = \lambda \overline{1 + a_x}$$

TABLE XXXIII.

LOGARITHMS OF THE PRESENT VALUE OF AN ANNUITY OF £1 ON A SINGLE LIFE, PAYABLE IN ADVANCE.

AGE. (x)	$\lambda \overline{1 + a_x}$ 3 per cent.	$\lambda \overline{1 + a_x}$ 3½ per cent.	$\lambda \overline{1 + a_x}$ 4 per cent.	$\lambda \overline{1 + a_x}$ 5 per cent.	$\lambda \overline{1 + a_x}$ 6 per cent.
53	1.151 6758	1.131 5334	1.112 1030	1.075 2533	1.040 8893
54	1.139 8227	1.120 2162	1.101 2908	1.065 3653	1.031 8225
55	1.127 3866	1.108 3136	1.089 8915	1.054 8885	1.022 1673
56	1.114 4181	1.095 8739	1.077 9512	1.043 8663	1.011 9647
57	1.100 8637	1.082 8428	1.065 4150	1.032 2404	1.001 1535
58	1.087 0024	1.069 4975	1.052 5580	1.020 2827	0.990 0014
59	1.073 3972	1.056 4000	1.039 9415	1.008 5528	0.979 0665
60	1.060 3724	1.043 8766	1.027 8931	0.997 3809	0.968 6817
61	1.048 4633	1.032 4651	1.016 9534	0.987 3139	0.959 3998
62	1.036 4348	1.020 9360	1.005 8990	0.977 1393	0.950 0197
63	1.023 9382	1.008 9417	0.994 3833	0.966 5127	0.940 2001
64	1.010 5357	0.996 0445	0.981 9681	0.954 9967	0.929 5034
65	0.996 3956	0.982 4109	0.968 8188	0.942 7532	0.918 0879
66	0.981 2936	0.967 8153	0.954 7082	0.929 5528	0.905 7236
67	0.965 1063	0.952 1323	0.939 5092	0.915 2643	0.892 2745
68	0.947 8486	0.935 3743	0.923 2313	0.899 8918	0.877 7395
69	0.929 3839	0.917 4014	0.905 7318	0.883 2870	0.861 9646
70	0.909 7280	0.898 2254	0.887 0187	0.865 4493	0.844 9415
71	0.888 5426	0.877 5038	0.866 7438	0.846 0221	0.826 3035
72	0.867 6100	0.857 0115	0.846 6761	0.826 7593	0.807 7904
73	0.847 7858	0.837 6034	0.827 6693	0.808 5127	0.790 2518
74	0.829 4470	0.819 6595	0.810 1062	0.791 6707	0.774 0808
75	0.813 7120	0.804 3034	0.795 1155	0.777 3719	0.760 4258
76	0.797 7458	0.788 7114	0.779 8846	0.762 8260	0.746 5190
77	0.782 4099	0.773 7451	0.765 2755	0.748 8963	0.733 2240
78	0.766 2714	0.757 9765	0.749 8647	0.734 1678	0.719 1361
79	0.747 5471	0.739 6207	0.731 8665	0.716 8534	0.702 4656
80	0.729 5474	0.721 9786	0.714 5716	0.700 2235	0.686 4636
81	0.709 1614	0.701 9428	0.694 8770	0.681 1830	0.668 0433
82	0.689 9870	0.683 1008	0.676 3583	0.663 2870	0.650 7381
83	0.669 4891	0.662 9215	0.656 4901	0.644 0178	0.632 0401
84	0.648 7549	0.642 4845	0.636 3430	0.624 4317	0.612 9899
85	0.626 2610	0.620 2614	0.614 3848	0.602 9862	0.592 0356
86	0.605 6297	0.599 8585	0.594 2052	0.583 2389	0.572 7031
87	0.588 0861	0.582 4981	0.577 0241	0.566 4046	0.556 2009
88	0.577 0288	0.571 5820	0.566 2458	0.555 8918	0.545 9421
89	0.564 0617	0.558 7390	0.553 5239	0.543 4036	0.533 6768
90	0.543 9077	0.538 6741	0.533 5449	0.523 5890	0.514 0178
91	0.541 6519	0.536 4088	0.531 2678	0.521 2795	0.511 6670
92	0.553 5189	0.548 2473	0.543 0732	0.533 0078	0.523 3039
93	0.566 6187	0.561 3876	0.556 2474	0.546 2324	0.536 5577
94	0.572 3644	0.567 2727	0.562 2642	0.552 4899	0.543 0284
95	0.574 8340	0.569 9691	0.565 1783	0.555 8138	0.546 7284
96	0.568 6577	0.564 1179	0.559 6421	0.550 8792	0.542 3594
97	0.551 2810	0.547 1532	0.543 0795	0.535 0906	0.527 3072
98	0.529 9866	0.526 3379	0.522 7332	0.515 6528	0.508 7398
99	0.495 6679	0.492 5857	0.489 5374	0.483 5413	0.477 6758
100	0.428 5488	0.426 1155	0.423 7070	0.418 9642	0.414 3176
101	0.347 9514	0.346 1683	0.344 4024	0.340 9206	0.337 5045
102	0.248 2291	0.247 0922	0.245 9651	0.243 7409	0.241 5556
103	0.121 7646	0.121 2515	0.120 7425	0.119 7374	0.118 7490
104	0.000 0000	0.000 0000	0.000 0000	0.000 0000	0.000 0000

$$\lambda N_x - \lambda D_x = \lambda \overline{1 + a_x}$$

TABLE XXXIV.

TABLE FOR FINDING THE VALUE OF ADVOWSONS, PRESENTATIONS TO LIVINGS,
AND THE RENEWAL OF LEASES ON LIVES.

AGE. (x)	$\lambda \overline{1 - A_x}$ 3 per cent.	$\lambda \overline{1 - A_x}$ 3½ per cent.	$\lambda \overline{1 - A_x}$ 4 per cent.	$\lambda \overline{1 - A_x}$ 5 per cent.	$\lambda \overline{1 - A_x}$ 6 per cent.
0	9.727 2053	9.751 1136	9.769 1966	9.794 4887	9.811 2603
1	9.788 2429	9.811 7687	9.829 4163	9.853 7238	9.869 4179
2	9.816 4756	9.839 9409	9.857 4756	9.881 4372	9.896 6780
3	9.838 7197	9.862 2640	9.879 8251	9.903 7173	9.918 7727
4	9.849 6201	9.873 3534	9.891 0512	9.915 0936	9.930 1796
5	9.856 8518	9.880 8324	9.898 7261	9.923 0360	9.938 2674
6	9.859 5361	9.883 8075	9.901 9405	9.926 6062	9.942 0699
7	9.859 8995	9.884 4871	9.902 8852	9.927 9571	9.943 7031
8	9.858 7477	9.883 6676	9.902 3467	9.927 8581	9.943 9184
9	9.856 5773	9.881 8398	9.900 8110	9.926 7828	9.943 1782
10	9.853 6619	9.879 2738	9.898 5436	9.924 9897	9.941 7335
11	9.850 3641	9.876 3288	9.895 9020	9.922 8305	9.939 9298
12	9.847 0698	9.873 3906	9.893 2695	9.920 6858	9.938 1457
13	9.843 7117	9.870 3918	9.890 5796	9.918 4898	9.936 3156
14	9.840 2881	9.867 3302	9.887 8299	9.916 2400	9.934 4370
15	9.836 8643	9.864 2712	9.885 0860	9.914 0022	9.932 5760
16	9.833 5800	9.861 3552	9.882 4885	9.911 9175	9.930 8741
17	9.830 3760	9.858 5238	9.879 9800	9.909 9305	9.929 2780
18	9.827 1187	9.855 6440	9.877 4281	9.907 9103	9.927 6584
19	9.823 7355	9.852 6430	9.874 7603	9.905 7849	9.925 9439
20	9.820 2194	9.849 5145	9.871 9703	9.903 5478	9.924 1276
21	9.816 5637	9.846 2510	9.869 0502	9.901 1912	9.922 2021
22	9.812 6883	9.842 7727	9.865 9204	9.898 6347	9.920 0867
23	9.808 6532	9.839 1387	9.862 6394	9.895 9365	9.917 8384
24	9.804 4492	9.835 3400	9.859 1979	9.893 0866	9.915 4472
25	9.800 0669	9.831 3666	9.855 5858	9.890 0744	9.912 9017
26	9.795 5701	9.827 2823	9.851 8664	9.886 9627	9.910 2642
27	9.790 8783	9.823 0062	9.847 9588	9.883 6705	9.907 4537
28	9.786 1305	9.818 6772	9.844 0017	9.880 3354	9.904 6069
29	9.781 5542	9.814 5227	9.840 2227	9.877 1859	9.901 9528
30	9.777 2424	9.810 6374	9.836 7172	9.874 3195	9.899 5918
31	9.772 8321	9.806 6591	9.833 1252	9.871 3799	9.897 1703
32	9.768 2402	9.802 5057	9.829 3646	9.868 2851	9.894 6076
33	9.763 3763	9.798 0861	9.825 3443	9.864 9445	9.891 8132
34	9.758 2222	9.793 3819	9.821 0454	9.861 3380	9.888 7660
35	9.752 8387	9.788 4532	9.816 5275	9.857 5247	9.885 5238
36	9.747 2105	9.783 2850	9.811 7753	9.853 4881	9.882 0707
37	9.741 4044	9.777 9432	9.806 8546	9.849 2939	9.878 4711
38	9.735 4097	9.772 4172	9.801 7546	9.844 9314	9.874 7145
39	9.729 2151	9.766 6955	9.796 4638	9.840 3885	9.870 7890
40	9.722 9793	9.760 9372	9.791 1407	9.835 8240	9.866 8535
41	9.716 8783	9.755 3184	9.785 9631	9.831 4170	9.863 0878
42	9.710 7580	9.749 6865	9.780 7786	9.827 0179	9.859 3457
43	9.704 5356	9.743 9592	9.775 5065	9.822 5479	9.855 5505
44	9.698 0289	9.737 9552	9.769 9660	9.817 8272	9.851 5242
45	9.691 2169	9.731 6534	9.764 1359	9.812 8351	9.847 2458
46	9.683 9838	9.724 9379	9.757 9004	9.807 4555	9.842 6001
47	9.676 2944	9.717 7728	9.751 2223	9.801 6510	9.837 5489
48	9.668 0127	9.710 0218	9.743 9659	9.795 2842	9.831 9536
49	9.658 8894	9.701 4342	9.735 8789	9.788 1012	9.825 5588
50	9.649 0397	9.692 1236	9.727 0725	9.780 2088	9.818 4668
51	9.638 3930	9.682 0170	9.717 4725	9.771 5294	9.810 5971
52	9.627 3770	9.671 5402	9.707 5024	9.762 4824	9.802 3647
	$\lambda \overline{1 + P} =$ 1.535 7160	$\lambda \overline{1 + P} =$ 1.470 8723	$\lambda \overline{1 + P} =$ 1.414 9733	$\lambda \overline{1 + P} =$ 1.322 2193	$\lambda \overline{1 + P} =$ 1.247 1547

$$\lambda \overline{1 + a_x} - \lambda \overline{1 + P} = \lambda \overline{1 - A_x}$$

MORTALITY.

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TABLE XXXIV.

TABLE FOR FINDING THE VALUE OF ADVOWSONS, PRESENTATIONS TO LIVINGS,
AND THE RENEWAL OF LEASES ON LIVES.

Age. (x)	$\lambda \overline{1-A}_x$ 3 per cent.	$\lambda \overline{1-A}_x$ 3½ per cent.	$\lambda \overline{1-A}_x$ 4 per cent.	$\lambda \overline{1-A}_x$ 5 per cent.	$\lambda \overline{1-A}_x$ 6 per cent.
53	9.615 9598	9.660 6611	9.697 1297	9.753 0340	9.793 7346
54	9.604 1067	9.649 3439	9.686 3175	9.743 1460	9.784 6678
55	9.591 6706	9.637 4413	9.674 9182	9.732 6692	9.775 0126
56	9.578 7021	9.625 0016	9.662 9779	9.721 6470	9.764 8100
57	9.565 1477	9.611 9705	9.650 4417	9.710 0211	9.753 9988
58	9.551 2864	9.598 6252	9.637 5847	9.698 0634	9.742 8467
59	9.537 6812	9.585 5277	9.624 9682	9.686 3335	9.731 9118
60	9.524 6564	9.573 0043	9.612 9198	9.675 1616	9.721 5270
61	9.512 7473	9.561 5928	9.601 9801	9.665 0946	9.712 2451
62	9.500 7188	9.550 0637	9.590 9257	9.654 9200	9.702 8650
63	9.488 2222	9.538 0694	9.579 4100	9.644 2934	9.693 0454
64	9.474 8197	9.525 1722	9.566 9948	9.632 7774	9.682 3487
65	9.460 6796	9.511 5386	9.553 8455	9.620 5339	9.670 9332
66	9.445 5776	9.496 9430	9.539 7349	9.607 3335	9.658 5689
67	9.429 3903	9.481 2600	9.524 5359	9.593 0450	9.645 1198
68	9.412 1326	9.464 5020	9.508 2580	9.577 6725	9.630 5848
69	9.393 6679	9.446 5291	9.490 7585	9.561 0677	9.614 8099
70	9.374 0120	9.427 3531	9.472 0454	9.543 2300	9.597 7868
71	9.352 8266	9.406 6315	9.451 7705	9.523 8028	9.579 1488
72	9.331 8940	9.386 1392	9.431 7028	9.504 5400	9.560 6357
73	9.312 0698	9.366 7311	9.412 6960	9.486 2934	9.543 0971
74	9.293 7310	9.348 7872	9.395 1329	9.469 4514	9.526 9261
75	9.277 9960	9.333 4311	9.380 1422	9.455 1526	9.513 2711
76	9.262 0298	9.317 8391	9.364 9113	9.440 6067	9.499 3643
77	9.246 6939	9.302 8728	9.350 3022	9.426 6770	9.486 0693
78	9.230 5554	9.287 1042	9.334 8914	9.411 9485	9.471 9814
79	9.211 8311	9.268 7484	9.316 8932	9.394 6341	9.455 3109
80	9.193 8314	9.251 1063	9.299 5983	9.378 0042	9.439 3089
81	9.173 4454	9.231 0705	9.279 9037	9.358 9637	9.420 8886
82	9.154 2710	9.212 2285	9.261 3850	9.341 0677	9.403 5834
83	9.133 7731	9.192 0492	9.241 5168	9.321 7985	9.384 8854
84	9.113 0389	9.171 6122	9.221 3697	9.302 2124	9.365 8352
85	9.090 5450	9.149 3891	9.199 4115	9.280 7669	9.344 8809
86	9.069 9137	9.128 9862	9.179 2319	9.261 0196	9.325 5484
87	9.052 3701	9.111 6258	9.162 0508	9.244 1853	9.309 0462
88	9.041 3128	9.100 7097	9.151 2725	9.233 6725	9.298 7874
89	9.028 3457	9.087 8667	9.138 5506	9.221 1843	9.286 5221
90	9.008 1917	9.067 8018	9.118 5716	9.201 3697	9.266 8631
91	9.005 9359	9.065 5365	9.116 2945	9.199 0602	9.264 5123
92	9.017 8029	9.077 3750	9.128 0999	9.210 7885	9.276 1492
93	9.030 9027	9.090 5153	9.141 2741	9.224 0131	9.289 4030
94	9.036 6484	9.096 4004	9.147 2909	9.230 2706	9.295 8737
95	9.039 1180	9.099 0968	9.150 2050	9.233 5945	9.299 5737
96	9.032 9417	9.093 2456	9.144 6688	9.228 6599	9.295 2047
97	9.015 5650	9.076 2809	9.128 1062	9.212 8713	9.280 1525
98	8.994 2706	9.055 4656	9.107 7599	9.193 4335	9.261 5851
99	8.959 9519	9.021 7134	9.074 5641	9.161 3220	9.230 5211
100	8.892 8328	8.955 2432	9.008 7337	9.096 7449	9.167 1629
101	8.812 2354	8.875 2960	8.929 4291	9.018 7013	9.090 3498
102	8.712 5131	8.776 2199	8.830 9918	8.921 5216	8.994 4009
103	8.586 0486	8.650 3792	8.705 7692	8.797 5181	8.871 5943
104	8.464 2840	8.529 1277	8.585 0267	8.677 7807	8.752 8453
	$\lambda \overline{1+P} =$ 1.535 7160	$\lambda \overline{1+P} =$ 1.470 8723	$\lambda \overline{1+P} =$ 1.414 9733	$\lambda \overline{1+P} =$ 1.322 2193	$\lambda \overline{1+P} =$ 1.247 1547

$$\lambda \overline{1+a_x} - \lambda \overline{1+P} = \lambda \overline{1-A_x}$$

COMMUTATION TABLES

FOR

JOINT ANNUITIES.

TABLE XXXV.

CARLISLE MORTALITY, THREE PER CENT.

CARLISLE 3 PER CENT.
COMMUTATION TABLES FOR JOINT ANNUITIES.

Equal Ages.

AGES.		D_{xy}	N_{xy}	AGES.		D_{xy}	N_{xy}
(x)	(y)			(x)	(y)		
0	0	100000000.	1148008451.	54	54	3478722.1	36456417.5
1	1	69503418.	1048008451.	55	55	3264235.3	32977695.4
2	2	57039157.	978505033.	56	56	3056577.4	29713460.1
3	3	48421130.	921465876.	57	57	2855855.2	26656882.7
4	4	43510992.	873044746.	58	58	2658004.3	23801027.5
5	5	39851843.	829533754.	59	59	2457166.7	21143023.2
6	6	37325816.	789681911.	60	60	2252604.0	18685856.5
7	7	35353898.	752356095.	61	61	2042966.9	16433252.5
8	8	33723007.	717002197.	62	62	1844045.5	14390285.6
9	9	32311400.	683279190.	63	63	1658895.1	12546240.1
10	10	31052230.	650967790.	64	64	1489725.9	10887345.0
11	11	29877726.	619915560.	65	65	1333579.3	9397619.1
12	12	28728520.	590037834.	66	66	1190529.6	8064039.8
13	13	27613546.	561309314.	67	67	1059690.4	6873510.2
14	14	26532128.	533695768.	68	68	939517.07	5813819.84
15	15	25475501.	507163640.	69	69	829381.32	4874302.77
16	16	24428219.	481688139.	70	70	728079.14	4044921.45
17	17	23399593.	457259920.	71	71	635745.21	3316842.31
18	18	22404978.	433860327.	72	72	546718.99	2681097.10
19	19	21450561.	411455349.	73	73	460933.98	2134378.11
20	20	20534782.	390004788.	74	74	380323.32	1673444.13
21	21	19656139.	369470006.	75	75	305659.42	1293120.81
22	22	18819457.	349813867.	76	76	242770.64	987461.39
23	23	18016626.	330994410.	77	77	189658.63	744690.75
24	24	17246332.	312977784.	78	78	146695.93	555032.12
25	25	16507310.	295731452.	79	79	113112.51	408336.19
26	26	15792930.	279224142.	80	80	85350.845	295223.678
27	27	15107826.	263431212.	81	81	63919.845	209872.833
28	28	14440799.	248323386.	82	82	46561.138	145952.988
29	29	13777340.	233882587.	83	83	33380.009	99391.850
30	30	13114430.	220105247.	84	84	23366.005	66011.841
31	31	12476489.	206990817.	85	85	16052.990	42645.836
32	32	11867107.	194514328.	86	86	10600.608	26592.846
33	33	11289215.	182647221.	87	87	6694.912	15992.238
34	34	10741181.	171358006.	88	88	3993.0082	9297.3259
35	35	10217644.	160616825.	89	89	2359.6313	5304.3177
36	36	9717579.2	150399180.8	90	90	1410.0239	2944.6864
37	37	9236484.9	140681601.6	91	91	748.49886	1534.66255
38	38	8773832.6	131445116.7	92	92	370.76425	786.16369
39	39	8329102.6	122671284.1	93	93	186.60601	415.39944
40	40	7895563.2	114342181.5	94	94	99.40789	228.79343
41	41	7467510.9	106446618.3	95	95	54.28829	129.38554
42	42	7051645.4	98979107.4	96	96	30.98005	75.09726
43	43	6650876.8	91927462.0	97	97	18.42189	44.11721
44	44	6270217.4	85276585.2	98	98	10.81952	25.69532
45	45	5908756.6	79006367.8	99	99	6.48485	14.87580
46	46	5568011.7	73097611.2	100	100	4.21466	8.39094
47	47	5246833.1	67529599.5	101	101	2.47535	4.17628
48	48	4946320.3	62282766.4	102	102	1.22615	1.70094
49	49	4669346.7	57336446.1	103	103	.42856	.47479
50	50	4410132.9	52667099.4	104	104	.04623	.04623
51	51	4167548.2	48256966.5				
52	52	3931331.9	44089418.3				
53	53	3701668.9	40158086.4				

Equal Ages.

COMMUTATION TABLES FOR JOINT ANNUITIES.

Difference of Age 1 year.

AGES.		D_{xy}	N_{xy}	AGES.		D_{xy}	N_{xy}
(x)	(y)			(x)	(y)		
1	0	82145631.	1079689673.	55	54	3320335.6	34156625.6
2	1	62039890.	997544042.	56	55	3112359.9	30836290.0
3	2	51782784.	935504152.	57	56	2911167.4	27723930.1
4	3	45227058.	883721368.	58	57	2714734.2	24812762.7
5	4	41030337.	838404310.	59	58	2518120.7	22098028.5
6	5	38092332.	797463973.	60	59	2318147.8	19579907.8
7	6	35793544.	759461641.	61	60	2113754.2	17261760.0
8	7	34022263.	723668097.	62	61	1912484.3	15148005.8
9	8	32525383.	689645834.	63	62	1723362.6	13235521.5
10	9	31210856.	657120451.	64	63	1548973.7	11512158.9
11	10	30012457.	625909595.	65	64	1388813.8	9963185.2
12	11	28867673.	595897138.	66	65	1241540.6	8574371.4
13	12	27752308.	567029465.	67	66	1106728.2	7332830.8
14	13	26670339.	539277157.	68	67	983157.78	6226102.56
15	14	25617031.	512606818.	69	68	869782.86	5242944.78
16	15	24580384.	486989787.	70	69	765680.90	4373161.92
17	16	23557622.	462409403.	71	70	670366.38	3607481.02
18	17	22560972.	438851781.	72	71	580904.87	2937114.64
19	18	21600956.	416290809.	73	72	494632.71	2356209.77
20	19	20679773.	394689853.	74	73	412550.61	1861577.06
21	20	19795913.	374010080.	75	74	335951.62	1449026.45
22	21	18951083.	354214167.	76	75	268409.79	1113074.83
23	22	18143524.	335263084.	77	76	211429.59	844665.04
24	23	17368667.	317119560.	78	77	164352.66	633235.45
25	24	16625240.	299750893.	79	78	126924.58	468882.79
26	25	15909294.	283125653.	80	79	96814.547	341958.215
27	26	15219968.	267216359.	81	80	72778.510	245143.668
28	27	14553853.	251996391.	82	81	53754.031	172365.158
29	28	13898236.	237442538.	83	82	38845.114	118611.127
30	29	13244598.	223544302.	84	83	27517.998	79766.013
31	30	12603823.	210299704.	85	84	19083.217	52248.015
32	31	11989471.	197695881.	86	85	12853.599	33164.798
33	32	11404748.	185706410.	87	86	8300.7862	20311.1987
34	33	10850238.	174301662.	88	87	5094.5277	12010.4125
35	34	10322450.	163451424.	89	88	3024.4998	6915.8848
36	35	9818289.	153128974.	90	89	1797.2839	3891.3850
37	36	9334988.6	143310684.6	91	90	1012.2556	2094.1011
38	37	8870118.3	133975696.0	92	91	519.06995	1081.84550
39	38	8423162.7	125105577.7	93	92	259.17501	562.77555
40	39	7990465.6	116682415.0	94	93	134.20065	303.60054
41	40	7565904.9	108691949.4	95	94	72.38438	169.39989
42	41	7150140.1	101126044.5	96	95	40.40876	97.01551
43	42	6747860.1	93975904.4	97	96	23.53908	56.60675
44	43	6363003.0	87228044.3	98	97	13.91081	33.06766
45	44	5997506.7	80865041.3	99	98	8.25345	19.15685
46	45	5651705.2	74867534.6	100	99	5.15125	10.90340
47	46	5325741.5	69215829.4	101	100	3.18259	5.75215
48	47	5019623.4	63890087.9	102	101	1.71661	2.56956
49	48	4735333.4	58870464.5	103	102	.71426	.85295
50	49	4471315.1	54135131.1	104	103	.13869	.13869
51	50	4224230.0	49663816.0	Difference of Age 104 years.			
52	51	3988334.3	45439586.0				
53	52	3758807.0	41451251.7				
54	53	3535819.1	37692444.7	104	0	462.30500	462.30500

Difference of Age 104 years.

COMMUTATION TABLES FOR JOINT ANNUITIES.

Difference of Age 2 years.

AGES.		D_{xy}	N_{xy}	AGES.		D_{xy}	N_{xy}
(x)	(y)			(x)	(y)		
2	0	73324536.	1026688492.	56	54	3165850.0	31923336.4
3	1	56322680.	953363956.	57	55	2964296.2	28757486.4
4	2	48366962.	897041276.	58	56	2767313.2	25793190.2
5	3	42648567.	848674314.	59	57	2571865.1	23025877.0
6	4	39126132.	806025747.	60	58	2375653.2	20454011.9
7	5	36442288.	766899615.	61	59	2175257.9	18078358.7
8	6	34445348.	730457327.	62	60	1978750.4	15903100.8
9	7	32814011.	696011979.	63	61	1787322.4	13924350.4
10	8	31417550.	663197968.	64	62	1609169.4	12137028.0
11	9	30165772.	631780418.	65	63	1444048.1	10527858.6
12	10	28997850.	601614646.	66	64	1292962.9	9083810.5
13	11	27886733.	572616796.	67	65	1154148.5	7790847.6
14	12	26804360.	544730063.	68	66	1026798.5	6636699.1
15	13	25750474.	517925703.	69	67	910184.41	5609900.63
16	14	24716941.	492175229.	70	68	802979.42	4699716.22
17	15	23704363.	467458288.	71	69	704987.54	3896736.80
18	16	22713337.	443753925.	72	70	612539.57	3191749.26
19	17	21751352.	421040588.	73	71	525561.67	2579209.69
20	18	20824764.	399289236.	74	72	442712.05	2053648.02
21	19	19935687.	378464472.	75	73	364419.01	1610935.97
22	20	19085844.	358528785.	76	74	295010.40	1246516.96
23	21	18270423.	339442941.	77	75	233758.79	951506.56
24	22	17491002.	321172518.	78	76	183218.74	717747.77
25	23	16743169.	303681516.	79	77	142201.58	534529.03
26	24	16022951.	286938847.	80	78	108636.49	392327.45
27	25	15332110.	270915396.	81	79	82553.588	283690.963
28	26	14661883.	255583286.	82	80	61203.813	201137.375
29	27	14007043.	240921403.	83	81	44846.015	139933.562
30	28	13360820.	226914360.	84	82	32023.353	95087.547
31	29	12728923.	213553540.	85	83	22474.185	63064.194
32	30	12111834.	200824617.	86	84	15279.896	40590.009
33	31	11522344.	188712783.	87	85	10064.986	25310.113
34	32	10961279.	177190439.	88	86	6316.5258	15245.1269
35	33	10427256.	166229160.	89	87	3858.8445	8928.6011
36	34	9918998.8	155801904.0	90	88	2303.7009	5069.7566
37	35	9431733.3	145882905.2	91	89	1290.2695	2766.0557
38	36	8964715.0	136451171.9	92	90	701.98031	1475.78618
39	37	8515600.2	127486456.9	93	91	362.84501	773.80587
40	38	8080700.5	118970856.7	94	92	186.38979	410.96086
41	39	7656844.9	110890156.2	95	93	97.71892	224.57107
42	40	7244352.4	103233311.3	96	94	53.87834	126.85216
43	41	6842111.7	95988958.9	97	95	30.70315	72.97381
44	42	6455788.6	89146847.2	98	96	17.77493	42.27066
45	43	6086256.8	82691058.6	99	97	10.61158	24.49573
46	44	5736594.4	76604801.8	100	98	6.55614	13.88416
47	45	5405793.4	70868207.4	101	99	3.88983	7.32802
48	46	5095114.7	65462414.0	102	100	2.20707	3.43819
49	47	4805509.8	60367299.3	103	101	.99997	1.23112
50	48	4534503.3	55561789.5	104	102	.23115	.23115
51	49	4282833.1	51027286.2	Difference of Age 103 years.			
52	50	4042578.6	46744453.1				
53	51	3813307.9	42701874.5				
54	52	3590397.2	38888566.6	103	0	1428.5225	1819.6788
55	53	3374833.0	35298169.4	104	1	391.1563	391.1563

Difference of Age 103 years.

COMMUTATION TABLES FOR JOINT ANNUITIES.

Difference of Age 3 years.

AGES.		D_{xy}	N_{xy}	AGES.		D_{xy}	N_{xy}
(x)	(y)			(x)	(y)		
3	0	66567404.	980541150.	57	54	3015241.6	29757012.7
4	1	52607388.	913973746.	58	55	2817816.7	26741771.1
5	2	45609459.	861366358.	59	56	2621676.9	23923954.4
6	3	40669261.	815756899.	60	57	2426356.9	21302277.5
7	4	37519955.	775087638.	61	58	2229218.7	18875920.6
8	5	35069657.	737567683.	62	59	2036325.9	16646701.9
9	6	33222071.	702498026.	63	60	1849251.8	14610376.0
10	7	31696347.	669275955.	64	61	1668891.2	12761124.2
11	8	30365545.	637579608.	65	62	1500166.3	11092233.0
12	9	29145981.	607214063.	66	63	1344385.2	9592066.7
13	10	28012486.	578068082.	67	64	1201951.2	8247681.5
14	11	26934194.	550055596.	68	65	1070794.0	7045730.3
15	12	25879874.	523121402.	69	66	950585.96	5974936.33
16	13	24845696.	497241528.	70	67	840277.93	5024350.37
17	14	23836054.	472395832.	71	68	739329.51	4184072.44
18	15	22854819.	448559778.	72	69	644174.26	3444742.93
19	16	21898249.	425704959.	73	70	554182.51	2800568.67
20	17	20969755.	403806710.	74	71	470394.46	2246386.16
21	18	20075462.	382836955.	75	72	391061.56	1775991.70
22	19	19220604.	362761493.	76	73	320008.56	1384930.14
23	20	18400344.	343540889.	77	74	256925.34	1064921.58
24	21	17613337.	325140545.	78	75	202568.58	807996.24
25	22	16861098.	307527208.	79	76	158524.93	605427.66
26	23	16136608.	290666110.	80	77	121712.28	446902.73
27	24	15441643.	274529502.	81	78	92634.136	325190.450
28	25	14769913.	259087859.	82	79	69424.262	232556.314
29	26	14111014.	244317946.	83	80	51061.233	163132.052
30	27	13465419.	230206932.	84	81	36970.409	112070.819
31	28	12840619.	216741513.	85	82	26153.747	75100.410
32	29	12232051.	203900894.	86	83	17995.038	48946.663
33	30	11639940.	191668843.	87	84	11964.893	30951.625
34	31	11074302.	180028903.	88	85	7659.0027	18986.7322
35	32	10533968.	168954601.	89	86	4784.4458	11327.7295
36	33	10019709.	158420633.	90	87	2939.2047	6543.2837
37	34	9528478.2	148400923.9	91	88	1653.8261	3604.0790
38	35	9057622.3	138872445.7	92	89	894.77771	1950.25287
39	36	8606416.1	129814823.4	93	90	490.70468	1055.47516
40	37	8169379.8	121208407.3	94	91	260.94571	564.77048
41	38	7743312.4	113039027.5	95	92	135.72072	303.82477
42	39	7331427.5	105295715.1	96	93	72.73576	168.10405
43	40	6932265.3	97964287.6	97	94	40.93754	95.36829
44	41	6545960.6	91032022.3	98	95	23.18469	54.43075
45	42	6175007.0	84486061.7	99	96	13.55924	31.24606
46	43	5821483.5	78311054.7	100	97	8.42932	17.68683
47	44	5486988.9	72489571.2	101	98	4.95070	9.25751
48	45	5171700.0	67002582.3	102	99	2.69753	4.30681
49	46	4877780.9	61830882.3	103	100	1.28567	1.60928
50	47	4601703.4	56953101.4	104	101	.32361	.32361
51	48	4343357.7	52351398.0	Difference of Age 102 years.			
52	49	4098661.7	48008040.3				
53	50	3865171.7	43909378.6				
54	51	3642456.3	40044206.9				
55	52	3426926.1	36401750.6	102	0	2452.2970	4020.5969
56	53	3217811.8	32974824.5	103	1	1208.6729	1568.2999
				104	2	359.6270	359.6270

Difference of Age 102 years.

COMMUTATION TABLES FOR JOINT ANNUITIES.

Difference of Age 4 years.

AGES.		D _{x,y}	N _{x,y}	AGES.		D _{x,y}	N _{x,y}
(x)	(y)			(x)	(y)		
4	0	62176324.	939678779.	58	54	2866244.6	27658172.3
5	1	49608128.	877502455.	59	55	2669522.5	24791927.7
6	2	43492738.	827894327.	60	56	2473350.6	22122405.2
7	3	38999736.	784401589.	61	57	2276797.0	19649054.6
8	4	36106732.	745401853.	62	58	2086840.3	17372257.6
9	5	33824209.	709295121.	63	59	1903059.3	15285417.3
10	6	32090509.	675470912.	64	60	1726717.0	13382358.0
11	7	30635007.	643380403.	65	61	1555842.6	11655641.0
12	8	29339001.	612745396.	66	62	1396630.3	10099798.4
13	9	28155583.	583406395.	67	63	1249753.9	8703168.1
14	10	27055651.	555250812.	68	64	1115144.3	7453414.2
15	11	26005229.	528195161.	69	65	991315.97	6338269.86
16	12	24970548.	502189932.	70	66	877576.45	5346953.89
17	13	23960220.	477219384.	71	67	773671.48	4469377.44
18	14	22981790.	453259164.	72	68	675553.84	3695705.96
19	15	22034654.	430277374.	73	69	582803.35	3020152.12
20	16	21111374.	408242720.	74	70	496011.02	2437348.77
21	17	20215236.	387131346.	75	71	415514.32	1941337.75
22	18	19355365.	366916110.	76	72	343404.28	1525823.43
23	19	18530264.	347560745.	77	73	278696.30	1182419.15
24	20	17738585.	329030481.	78	74	222644.05	903722.85
25	21	16979028.	311291896.	79	75	175266.83	681078.80
26	22	16250265.	294312868.	80	76	135683.66	505811.97
27	23	15551177.	278062603.	81	77	103783.83	370128.31
28	24	14875430.	262511426.	82	78	77901.601	266344.481
29	25	14214985.	247635996.	83	79	57919.404	188442.880
30	26	13565369.	233421011.	84	80	42094.145	130523.476
31	27	12941146.	219855642.	85	81	30194.050	88429.331
32	28	12339387.	206914496.	86	82	20941.257	58235.281
33	29	11755473.	194575109.	87	83	14090.980	37294.024
34	30	11187325.	182819636.	88	84	9104.747	23203.044
35	31	10642585.	171632311.	89	85	5801.3035	14098.2972
36	32	10122249.	160989726.	90	86	3644.2166	8296.9937
37	33	9625222.9	150867477.3	91	87	2110.0539	4652.7771
38	34	9150529.6	141242254.4	92	88	1146.8974	2542.7232
39	35	8695610.1	132091724.8	93	89	625.47569	1395.82579
40	36	8256503.2	123396114.7	94	90	352.89800	770.35010
41	37	7828288.9	115139611.5	95	91	190.00901	417.45210
42	38	7414220.0	107311322.6	96	92	101.02189	227.44309
43	39	7015689.1	99897102.6	97	93	55.26567	126.42120
44	40	6632212.0	92881513.5	98	94	30.91292	71.15552
45	41	6261257.0	86249301.5	99	95	17.68596	40.24261
46	42	5906372.7	79988044.5	100	96	10.77080	22.55664
47	43	5568184.6	74081671.8	101	97	6.36518	11.78585
48	44	5249379.5	68513487.2	102	98	3.43322	5.42066
49	45	4951099.6	63264107.7	103	99	1.57137	1.98745
50	46	4670909.5	58313008.1	104	100	.41607	.41607
51	47	4407725.0	53642098.6	Difference of Age 101 years.			
52	48	4156583.6	49234373.6	101	0	3536.2123	7058.6290
53	49	3918793.6	45077790.0	102	1	2074.8885	3522.4167
54	50	3691996.4	41158996.4	103	2	1111.2476	1447.5282
55	51	3476615.0	37467000.0	104	3	336.2806	336.2806
56	52	3267481.2	33990385.0				
57	53	3064731.5	30722903.8				

Difference of Age 101 years.

COMMUTATION TABLES FOR JOINT ANNUITIES.

Difference of Age 5 years.

AGES.		D_{xy}	N_{xy}	AGES.		D_{xy}	N_{xy}
(x)	(y)			(x)	(y)		
5	0	58631519.	901967504.	59	54	2715401.9	25629601.1
6	1	47305831.	843335985.	60	55	2518489.2	22914199.2
7	2	41707306.	796030154.	61	56	2320894.0	20395710.0
8	3	37530776.	754322848.	62	57	2131379.8	18074816.0
9	4	34824454.	716792072.	63	58	1950267.8	15943436.2
10	5	32672137.	681967618.	64	59	1776959.1	13993168.4
11	6	31015970.	649295481.	65	60	1609751.4	12216209.3
12	7	29599353.	618279511.	66	61	1448464.0	10606457.9
13	8	28342044.	588680158.	67	62	1298321.5	9157993.9
14	9	27193861.	560338114.	68	63	1159494.6	7859672.4
15	10	26122498.	533144253.	69	64	1032374.4	6700177.8
16	11	25091499.	507021755.	70	65	915178.2	5667803.4
17	12	24080623.	481930256.	71	66	808013.45	4752625.19
18	13	23101506.	457849633.	72	67	706933.42	3944611.74
19	14	22157069.	434748127.	73	68	611193.39	3237678.32
20	15	21242878.	412591058.	74	69	521627.58	2626484.93
21	16	20351759.	391348180.	75	70	438142.23	2104857.35
22	17	19490125.	370996421.	76	71	364877.07	1666715.12
23	18	18660184.	351506296.	77	72	299071.70	1301838.05
24	19	17863833.	332846112.	78	73	241510.13	1002766.35
25	20	17099765.	314982279.	79	74	192636.58	761256.22
26	21	16363922.	297882514.	80	75	150013.29	568619.64
27	22	15660711.	281518592.	81	76	115697.21	418606.35
28	23	14980947.	265857881.	82	77	87278.05	302909.14
29	24	14316537.	250876934.	83	78	64991.895	215631.092
30	25	13665320.	236560397.	84	79	47747.923	150639.197
31	26	13037205.	222895077.	85	80	34378.650	102891.274
32	27	12435990.	209857872.	86	81	24176.320	68512.624
33	28	11858627.	197421882.	87	82	16398.011	44336.304
34	29	11298366.	185563255.	88	83	10722.604	27938.293
35	30	10751202.	174264889.	89	84	6896.3809	17215.6892
36	31	10226621.	163513687.	90	85	4418.7367	10319.3083
37	32	9723726.6	153287065.7	91	86	2616.1817	5900.5716
38	33	9243436.9	143563339.1	92	87	1463.2829	3284.3899
39	34	8784804.2	134319902.2	93	88	801.71469	1821.10696
40	35	8342071.0	125535098.0	94	89	449.82070	1019.39227
41	36	7911774.8	117193027.0	95	90	256.96456	569.57157
42	37	7495585.1	109281252.2	96	91	141.43065	312.60701
43	38	7094815.0	101785667.1	97	92	76.75788	171.17636
44	39	6711929.2	94690852.1	98	93	41.73244	94.41848
45	40	6343757.1	87978922.9	99	94	23.58128	52.68604
46	41	5988870.6	81635165.8	100	95	14.04887	29.70476
47	42	5649380.1	75646295.2	101	96	8.13329	15.05589
48	43	5327059.0	69996915.1	102	97	4.41413	6.92260
49	44	5025465.6	64669856.1	103	98	1.99993	2.50847
50	45	4741118.6	59644390.5	104	99	.50854	.50854
51	46	4474013.8	54903271.9	Difference of Age 100 years.			
52	47	4218183.0	50429258.1	100	0	4682.9554	10945.2147
53	48	3974173.6	46211075.1	101	1	2991.9892	6262.2593
54	49	3743215.8	42236901.5	102	2	1907.6418	3270.2701
55	50	3523899.5	38493685.7	103	3	1039.1073	1362.6283
56	51	3314858.2	34969786.2	104	4	323.5210	323.5210
57	52	3112037.9	31654928.0				
58	53	2913289.0	28542890.1				

Difference of Age 100 years.

COMMUTATION TABLES FOR JOINT ANNUITIES.

Difference of Age 6 years.

AGES.		D _{xy}	N _{xy}	AGES.		D _{xy}	N _{xy}
(x)	(y)			(x)	(y)		
6	0	55910449.	866750324.	60	54	2561772.8	23677553.5
7	1	45363866.	810839875.	61	55	2363250.3	21115780.7
8	2	40136363.	765476009.	62	56	2172660.4	18752630.4
9	3	36197925.	725339646.	63	57	1991892.4	16579870.0
10	4	33638313.	689141721.	64	58	1821039.5	14587977.6
11	5	31578122.	655503408.	65	59	1656590.1	12766938.1
12	6	29967437.	623925286.	66	60	1498652.2	11110348.0
13	7	28593550.	593957849.	67	61	1346506.6	9611695.8
14	8	27373953.	565364299.	68	62	1204554.6	8265189.2
15	9	26255941.	537990346.	69	63	1073432.9	7060634.6
16	10	25204647.	511734405.	70	64	953083.2	5987201.7
17	11	24197263.	486529758.	71	65	842634.62	5034118.54
18	12	23217594.	462332495.	72	66	738313.00	4191483.92
19	13	22272489.	439114901.	73	67	639583.40	3453170.92
20	14	21360894.	416842412.	74	68	547037.56	2813587.52
21	15	20478531.	395481518.	75	69	460770.15	2266549.96
22	16	19621752.	375002987.	76	70	384747.40	1805779.81
23	17	18790105.	355381235.	77	71	317772.40	1421032.41
24	18	17989080.	336591130.	78	72	259166.86	1103260.01
25	19	17220502.	318602050.	79	73	208959.93	844093.15
26	20	16480285.	301381548.	80	74	164880.28	635133.22
27	21	15770245.	284901263.	81	75	127916.06	470252.94
28	22	15086465.	269131018.	82	76	97296.722	342336.880
29	23	14418090.	254044553.	83	77	72814.496	245040.158
30	24	13762946.	239626463.	84	78	53578.381	172225.662
31	25	13133264.	225863517.	85	79	38996.139	118647.281
32	26	12528299.	212730253.	86	80	27526.921	79651.142
33	27	11951466.	200201954.	87	81	18931.221	52124.221
34	28	11397509.	188250488.	88	82	12478.150	33193.000
35	29	10857914.	176852979.	89	83	8121.8248	20714.8501
36	30	10330993.	165995065.	90	84	5252.8354	12593.0253
37	31	9823989.3	155664072.2	91	85	3172.2095	7340.1899
38	32	9338033.6	145840082.9	92	86	1814.2730	4167.9804
39	33	8873998.2	136502049.3	93	87	1022.8774	2353.7074
40	34	8427638.6	127628051.1	94	88	576.56575	1330.83000
41	35	7993769.8	119200412.5	95	89	327.53934	754.26425
42	36	7575522.8	111206642.7	96	90	191.26812	426.72491
43	37	7172674.9	103631119.9	97	91	107.46103	235.45679
44	38	6787726.0	96458445.0	98	92	57.96172	127.99576
45	39	6420007.1	89670719.0	99	93	31.83473	70.03404
46	40	6067781.6	83250711.9	100	94	18.73182	38.19931
47	41	5728288.4	77182930.3	101	95	10.60864	19.46749
48	42	5404738.4	71454641.9	102	96	5.64028	8.85885
49	43	5099831.5	66049903.5	103	97	2.57134	3.21857
50	44	4812330.7	60950072.0	104	98	.64723	.64723
51	45	4541263.4	56137741.3	Difference of Age 99 years.			
52	46	4281621.3	51596477.9	99	0	5895.3205	15706.0981
53	47	4033069.8	47314856.6	100	1	3962.2486	9810.7776
54	48	3796114.5	43281786.8	101	2	2750.8195	5848.5290
55	49	3572786.9	39485672.3	102	3	1783.8008	3097.7095
56	50	3359942.7	35912885.4	103	4	999.6800	1313.9087
57	51	3157161.0	32552942.7	104	5	314.2287	314.2287
58	52	2958257.8	29395781.7				
59	53	2759970.4	26437523.9				

Difference of Age 99 years.

COMMUTATION TABLES FOR JOINT ANNUITIES.

Difference of Age 7 years.

AGES.		D _{x,y}	N _{x,y}	AGES.		D _{x,y}	N _{x,y}
(x)	(y)			(x)	(y)		
7	0	53615254.	833313606.	61	54	2403866.0	21809237.3
8	1	43655196.	779698352.	62	55	2212311.4	19405371.3
9	2	38710978.	736043156.	63	56	2030471.4	17193059.9
10	3	34965003.	697332178.	64	57	1859906.0	15162588.5
11	4	32511947.	662367175.	65	58	1697684.5	13302682.5
12	5	30510586.	629855228.	66	59	1542258.3	11604998.0
13	6	28949126.	599344642.	67	60	1393162.0	10062739.7
14	7	27616867.	570395516.	68	61	1249259.7	8669577.7
15	8	26429821.	542778649.	69	62	1115148.3	7420318.0
16	9	25333402.	516348828.	70	63	990988.19	6305169.68
17	10	24306378.	491015426.	71	64	877535.00	5314181.49
18	11	23330054.	466709048.	72	65	769947.70	4436646.49
19	12	22384411.	443378994.	73	66	667973.43	3666698.79
20	13	21472166.	420994583.	74	67	572447.54	2998725.36
21	14	20592301.	399522417.	75	68	483215.60	2426277.82
22	15	19743976.	378930116.	76	69	404617.73	1943062.22
23	16	18917004.	359186140.	77	70	335077.54	1538444.49
24	17	18114328.	340269136.	78	71	275372.34	1203366.95
25	18	17341240.	322154808.	79	72	224236.92	927994.61
26	19	16596649.	304813568.	80	73	178851.67	703757.69
27	20	15882386.	288216919.	81	74	140593.11	524906.02
28	21	15191982.	272334533.	82	75	107572.28	384312.91
29	22	14519643.	257142551.	83	76	81172.894	276740.632
30	23	13860572.	242622908.	84	77	60027.223	195567.738
31	24	13227089.	228762336.	85	78	43757.924	135540.515
32	25	12620609.	215535247.	86	79	31224.135	91782.591
33	26	12040179.	202914638.	87	80	21554.902	60558.456
34	27	11486738.	190874459.	88	81	14405.810	39003.554
35	28	10953192.	179387721.	89	82	9451.5618	24597.7437
36	29	10433534.	168434529.	90	83	6186.2314	15146.1819
37	30	9924252.	158000995.	91	84	3771.0086	8959.9505
38	31	9434319.4	148076742.6	92	85	2199.8679	5188.9419
39	32	8964814.0	138642423.2	93	86	1268.2297	2989.0740
40	33	8513206.3	129677609.2	94	87	735.61837	1720.84433
41	34	8075764.9	121164402.9	95	88	419.82943	985.22596
42	35	7654033.0	113088638.0	96	89	243.79951	565.39653
43	36	7249168.8	105434605.0	97	90	145.32826	321.59702
44	37	6862215.8	98185436.2	98	91	81.14641	176.26876
45	38	6492507.2	91323220.4	99	92	44.21490	95.12235
46	39	6140714.6	84830713.2	100	93	25.28796	50.90745
47	40	5803765.9	78689998.6	101	94	14.14485	25.61949
48	41	5480229.7	72886232.7	102	95	7.35689	11.47464
49	42	5174197.5	67406003.0	103	96	3.28560	4.11775
50	43	4883542.7	62231805.5	104	97	.83215	.83215
51	44	4609473.6	57348262.8	Difference of Age 98 years.			
52	45	4345978.9	52738789.2	98	0	7728.2293	21927.0907
53	46	4093724.1	48392810.3	99	1	4988.0307	14198.8614
54	47	3852371.9	44299086.2	100	2	3642.8710	9210.8307
55	48	3623277.1	40446714.3	101	3	2572.2408	5567.9597
56	49	3406555.5	36823437.2	102	4	1716.1174	2995.7189
57	50	3200100.8	3341681.7	103	5	970.9667	1279.6015
58	51	3001151.2	30216780.9	104	6	308.6348	308.6348
59	52	2802572.6	27215629.7				
60	53	2603819.8	24413057.1				

Difference of Age 98 years.

COMMUTATION TABLES FOR JOINT ANNUITIES.

Difference of Age 8 years.

AGES.		D _{x,y}	N _{x,y}	AGES.		D _{x,y}	N _{x,y}
(x)	(y)			(x)	(y)		
8	0	51595788.	801307257.	62	54	2250333.0	20033361.7
9	1	42104845.	749711469.	63	55	2067527.5	17783028.7
10	2	37392460.	707606624.	64	56	1895928.6	15715501.2
11	3	33794213.	670214164.	65	57	1733918.3	13819572.6
12	4	31412841.	636419951.	66	58	1580516.5	12085654.3
13	5	29473818.	605007110.	67	59	1433698.7	10505137.8
14	6	27960298.	575533292.	68	60	1292545.6	9071439.1
15	7	26664357.	547572994.	69	61	1156535.3	7778893.5
16	8	25501173.	520908637.	70	62	1029499.7	6622358.2
17	9	24430544.	495407464.	71	63	912435.37	5592858.55
18	10	23435259.	470976920.	72	64	801837.51	4680423.18
19	11	22492835.	447541661.	73	65	696594.27	3878585.67
20	12	21580067.	425048826.	74	66	597857.51	3181991.40
21	13	20699569.	403468759.	75	67	505661.03	2584133.89
22	14	19853665.	382769190.	76	68	424327.84	2078472.86
23	15	19034838.	362915525.	77	69	352382.66	1654145.02
24	16	18236663.	343880687.	78	70	290368.47	1301762.36
25	17	17461977.	325644024.	79	71	238258.26	1011393.89
26	18	16713012.	308182047.	80	72	191927.45	773135.63
27	19	15994528.	291469035.	81	73	152506.49	581208.18
28	20	15300012.	275474507.	82	74	118233.18	428701.69
29	21	14621196.	260174495.	83	75	89745.609	310468.509
30	22	13958198.	245553299.	84	76	66917.765	220722.900
31	23	13320914.	231595101.	85	77	49024.748	153805.135
32	24	12710771.	218274187.	86	78	35036.888	104780.387
33	25	12128892.	205563416.	87	79	24450.000	69743.499
34	26	11572001.	193434524.	88	80	16402.314	45293.499
35	27	11038943.	181862523.	89	81	10911.665	28891.185
36	28	10525089.	170823580.	90	82	7199.0655	17979.5202
37	29	10022756.	160298491.	91	83	4441.0932	10780.4547
38	30	9530605.2	150275734.6	92	84	2615.1238	6339.3615
39	31	9057251.5	140745129.4	93	85	1537.7717	3724.2377
40	32	8600329.7	131687877.9	94	86	912.06737	2186.46605
41	33	8157759.9	123087548.2	95	87	535.64444	1274.39868
42	34	7732543.2	114929788.3	96	88	312.49440	738.75424
43	35	7324296.8	107197245.1	97	89	185.24235	426.25984
44	36	6935398.8	99872948.3	98	90	109.74086	241.01749
45	37	6563757.4	92937549.5	99	91	61.90086	131.27663
46	38	6210060.7	86373792.1	100	92	35.12216	69.37577
47	39	5873525.5	80163731.4	101	93	19.09555	34.25360
48	40	5552438.8	74290205.9	102	94	9.80919	15.15806
49	41	5246468.7	68737767.1	103	95	4.28557	5.34887
50	42	4954754.8	63491298.4	104	96	1.06330	1.06330
51	43	4677683.8	58536543.6	Difference of Age 97 years.			
52	44	4411255.9	53858859.8	97	0	10234.384	30165.5836
53	45	4155257.4	49447603.9	98	1	6538.8548	19931.1996
54	46	3910308.6	45292346.5	99	2	4585.9698	13392.3448
55	47	3676973.1	41382037.9	100	3	3406.3818	8806.3750
56	48	3454696.6	37705064.8	101	4	2474.6414	5399.9932
57	49	3244496.1	34250368.2	102	5	1666.8263	2925.3518
58	50	3041969.0	31005872.1	103	6	953.6816	1258.5255
59	51	2843208.6	27963903.1	104	7	304.8439	304.8439
60	52	2644011.7	25120694.5				
61	53	2443321.1	22476682.8				

Difference of Age 97 years.

COMMUTATION TABLES FOR JOINT ANNUITIES.

Difference of Age 9 years.

AGES.		D_{xy}	N_{xy}	AGES.		D_{xy}	N_{xy}
(x)	(y)			(x)	(y)		
9	0	4973438.	77510143.	63	54	2103060.7	18342652.7
10	1	4670730.	726746705.	64	55	1936520.3	16246792.0
11	2	36140388.	684075975.	65	56	1767500.8	14316262.7
12	3	32651758.	643235587.	66	57	1614249.6	12548761.9
13	4	30454114.	611283829.	67	58	1469263.9	10934512.3
14	5	28467098.	580038415.	68	59	1330154.6	9465248.4
15	6	26805943.	552471347.	69	60	1196998.4	8135003.8
16	7	25727468.	525475404.	70	61	1067707.9	6938485.4
17	8	24502336.	49747936.	71	62	947894.15	5870777.48
18	9	2354975.	47515500.	72	63	833727.32	4922883.33
19	10	22594265.	45190925.	73	64	725445.92	4089156.01
20	11	21684735.	42666390.	74	65	623474.07	3363710.09
21	12	20803587.	40321765.	75	66	528106.46	2740236.02
22	13	19957086.	380518178.	76	67	44037.92	2212129.56
23	14	19145687.	360561092.	77	68	369548.23	1769091.64
24	15	1837290.	34742005.	78	69	305364.58	1398543.41
25	16	1767906.	329070245.	79	70	251233.25	1093178.83
26	17	16926375.	311490329.	80	71	203228.51	841945.58
27	18	1619970.	294907064.	81	72	163656.19	638017.07
28	19	1548841.	278554294.	82	73	128251.85	474360.88
29	20	14725167.	263146233.	83	74	98239.80	346109.03
30	21	14005824.	248421086.	84	75	73654.988	247469.235
31	22	13414739.	234305262.	85	76	54652.313	173484.247
32	23	1280934.	22050623.	86	77	39254.025	118831.934
33	24	12215542.	208140589.	87	78	27435.568	79577.909
34	25	1167245.	19534947.	88	79	18905.352	52142.341
35	26	1112882.	184276782.	89	80	12423.915	33536.989
36	27	1057488.	17315090.	90	81	8311.197	21113.074
37	28	1011788.	16248412.	91	82	5168.2664	12801.8766
38	29	9625091.8	152437706.3	92	83	3072.8150	7633.6702
39	30	914688.9	142425445.	93	84	1828.0477	4553.8552
40	31	8684090.	133028156.	94	85	1105.9128	2725.8075
41	32	8241245.7	124375806.	95	86	684.12673	1619.80471
42	33	7811653.4	1167025009.	96	87	398.26074	955.76798
43	34	7399244.7	109821075.	97	88	237.43771	557.06824
44	35	7007275.0	103522682.8	98	89	139.88495	319.63053
45	36	6637577.4	97514817.8	99	90	83.71355	179.74958
46	37	6278211.1	91843704.	100	91	49.17103	96.03608
47	38	5938542.	8628892.3	101	92	28.52150	46.86500
48	39	5619177.5	8092083.1	102	93	13.24240	20.34341
49	40	5318757.6	75943807.6	103	94	5.71409	7.10100
50	41	5028000.	71282100.	104	95	1.38691	1.38691
51	42	4748940.	6674240.1	Difference of Age 96 years.			
52	43	4476302.9	6245835.1	96	0	13469.586	40990.9234
53	44	4217006.8	5841822.2	97	1	8679.3123	27521.3374
54	45	3980850.	5464132.4	98	2	6011.7896	18862.0251
55	46	3762272.0	5125977.4	99	3	4288.2561	12850.2355
56	47	3565864.3	4827705.4	100	4	3277.1322	8561.9794
57	48	339046.9	3505691.1	101	5	2403.5635	5284.8473
58	49	3234170.6	3176654.2	102	6	1637.1535	2881.2937
59	50	2881878.3	2882383.6	103	7	941.9677	1244.1302
60	51	2682348.7	2589005.3	104	8	302.1625	302.1625
61	52	2481035.7	23118156.6				
62	53	2287268.2	20637120.9				

Difference of Age 96 years.

COMMUTATION TABLES FOR JOINT ANNUITIES.

Difference of Age 10 years.

AGES.		D _{x,y}	N _{x,y}	AGES.		D _{x,y}	N _{x,y}
(x)	(y)			(x)	(y)		
10	0	48068467.	740775935.	64	54	1963708.1	16756583.7
11	1	39308885.	692707468.	65	55	1799757.7	14792875.6
12	2	34918618.	653398583.	66	56	1645514.4	12993117.9
13	3	31542232.	618479965.	67	57	1500622.5	11347603.5
14	4	29308893.	586937733.	68	58	1363151.3	9846981.0
15	5	27485235.	557628840.	69	59	1231426.0	8483829.7
16	6	26047403.	530143605.	70	60	1104703.2	7252403.7
17	7	24810567.	504096202.	71	61	983073.72	6147700.47
18	8	23710968.	479285635.	72	62	866127.38	5164626.75
19	9	22709684.	455574667.	73	63	754297.57	4298499.37
20	10	21782380.	432864983.	74	64	649297.23	3544201.80
21	11	20904355.	411082603.	75	65	550734.39	2894904.57
22	12	20057373.	390178248.	76	66	463748.02	2344170.18
23	13	19240294.	370120875.	77	67	386713.80	1880422.16
24	14	18452206.	350880581.	78	68	320239.77	1493708.36
25	15	17689412.	332428375.	79	69	264208.22	1173468.59
26	16	16943032.	314738963.	80	70	215033.97	909260.37
27	17	16218811.	297795931.	81	71	173889.47	694226.40
28	18	15516071.	281577120.	82	72	137628.30	520336.93
29	19	14829138.	266061049.	83	73	106998.20	382708.63
30	20	14155774.	251231911.	84	74	81317.232	275710.429
31	21	13508564.	237076137.	85	75	60424.174	194393.197
32	22	12891096.	223567573.	86	76	43760.005	133969.023
33	23	12302191.	210676477.	87	77	30737.789	90209.018
34	24	11740545.	198374286.	88	78	20877.236	59471.229
35	25	11202821.	186633741.	89	79	14092.605	38593.993
36	26	10686224.	175430920.	90	80	9463.0475	24501.3885
37	27	10189860.	164744696.	91	81	5966.6052	15038.3410
38	28	9709663.	154554836.	92	82	3584.0544	9071.7358
39	29	9240504.7	144845173.5	93	83	2152.8804	5487.6814
40	30	8777688.2	135604668.8	94	84	1314.6693	3334.8010
41	31	8326222.4	126826980.6	95	85	805.27627	2020.13173
42	32	7890991.2	118500758.2	96	86	494.33381	1214.85546
43	33	7474552.8	110609767.0	97	87	302.93777	720.52165
44	34	7079151.2	103135214.2	98	88	179.29492	417.58388
45	35	6702507.5	96056063.0	99	89	106.70530	238.28896
46	36	6345166.0	89353555.5	100	90	66.49797	131.58366
47	37	6005039.4	83008389.5	101	91	37.13023	65.08570
48	38	5682633.9	77003350.1	102	92	18.39223	27.95547
49	39	5379489.6	71320716.2	103	93	7.71402	9.56324
50	40	5090158.0	65941226.6	104	94	1.84922	1.84922
51	41	4812182.8	60851068.6	Difference of Age 95 years.			
52	42	4541810.0	56038885.8	95	0	18096.096	55595.7812
53	43	4280082.1	51497075.8	96	1	11396.617	37499.6852
54	44	4028701.1	47216993.7	97	2	7961.3273	26103.0682
55	45	3788372.3	43188292.6	98	3	5621.5140	18141.7409
56	46	3558620.2	39399920.3	99	4	4125.5453	12520.2269
57	47	3339109.0	35841300.1	100	5	3183.0048	8394.6816
58	48	3127755.7	32502191.1	101	6	2360.7753	5211.6768
59	49	2921858.9	29374435.4	102	7	1617.0446	2850.9015
60	50	2718830.6	26452576.5	103	8	933.6823	1233.8569
61	51	2517009.5	23733745.9	104	9	300.1746	300.1746
62	52	2322573.9	21216736.4				
63	53	2137578.8	18894162.5				

Difference of Age 95 years.

COMMUTATION TABLES FOR JOINT ANNUITIES.

Difference of Age 11 years.

AGES.		$D_{x,y}$	$N_{x,y}$	AGES.		$D_{x,y}$	$N_{x,y}$
(x)	(y)			(x)	(y)		
11	0	46458912.	711996695.	65	54	1830689.0	15249577.4
12	1	37980001.	665537783.	66	55	1675545.0	13418888.4
13	2	33732063.	627557782.	67	56	1529686.6	11743343.4
14	3	30464831.	593825719.	68	57	1392245.1	10213656.8
15	4	28298025.	563360888.	69	58	1261973.5	8821411.7
16	5	26519503.	535062863.	70	59	1136846.6	7559438.2
17	6	25119100.	508543360.	71	60	1017136.5	6422591.6
18	7	23921377.	483424260.	72	61	898272.31	5405455.14
19	8	22860080.	459502883.	73	62	783610.85	4507182.83
20	9	21893652.	436642803.	74	63	675120.37	3723571.98
21	10	20998621.	414749151.	75	64	573544.79	3048451.61
22	11	20154526.	393750530.	76	65	483618.36	2474906.82
23	12	19336979.	373596004.	77	66	403879.37	1991288.46
24	13	18548326.	354259025.	78	67	335114.96	1587409.09
25	14	17787687.	335710699.	79	68	277078.57	1252294.13
26	15	17048571.	317923012.	80	69	226139.44	975215.56
27	16	16328345.	300874441.	81	70	183359.08	749076.12
28	17	15624101.	284546096.	82	71	146234.08	565717.04
29	18	14933109.	268921995.	83	72	114820.80	419482.96
30	19	14255725.	253988886.	84	73	88207.774	304662.165
31	20	13604623.	239733161.	85	74	66412.480	216454.391
32	21	12981259.	226128538.	86	75	48381.523	150041.911
33	22	12388841.	213147279.	87	76	34266.188	101660.388
34	23	11823825.	200758438.	88	77	23390.078	67394.200
35	24	11282855.	188934613.	89	78	15813.440	44004.122
36	25	10764961.	177651758.	90	79	10734.055	28190.682
37	26	10265497.	166886797.	91	80	6793.5182	17456.6275
38	27	9785678.	156621300.	92	81	4137.7290	10663.1093
39	28	9321590.	146835622.	93	82	2505.3584	6525.3803
40	29	8864812.	137514032.	94	83	1548.2778	4020.0219
41	30	8411199.	128649220.	95	84	957.28348	2471.74415
42	31	7972356.3	120238020.8	96	85	599.39657	1514.46067
43	32	7551046.8	112265664.5	97	86	375.60189	915.06410
44	33	7151027.4	104714617.7	98	87	228.75559	539.46221
45	34	6771257.6	97563590.3	99	88	136.77143	310.70662
46	35	6410925.1	90792332.7	100	89	84.76149	173.93519
47	36	6069081.0	84381407.6	101	90	50.21421	89.17370
48	37	5744996.2	78312326.6	102	91	25.74912	38.95948
49	38	5440239.2	72567330.4	103	92	10.71392	13.21037
50	39	5151340.2	67127091.2	104	93	2.49645	2.49645
51	40	4875589.5	61975751.0	Difference of Age 94 years.			
52	41	4605248.2	57100161.5	94	0	24851.972	75787.955
53	42	4342494.5	52494913.3	95	1	15311.107	50935.983
54	43	4088317.1	48152418.8	96	2	10477.991	35624.876
55	44	3845274.0	44064101.7	97	3	7444.491	25146.885
56	45	3612110.3	40218827.7	98	4	5408.2149	17702.3936
57	46	3389326.6	36606717.4	99	5	4007.0493	12294.1787
58	47	3174108.2	33217390.8	100	6	3126.3410	8287.1294
59	48	2963150.3	30043282.6	101	7	2331.7784	5160.7884
60	49	2756549.2	27080132.3	102	8	1602.8213	2829.0100
61	50	2551242.7	24323583.1	103	9	927.5397	1226.1887
62	51	2356250.2	21772340.4	104	10	298.6490	298.6490
63	52	2170573.9	19416090.2				
64	53	1995938.9	17245516.3				

Difference of Age 94 years.

COMMUTATION TABLES FOR JOINT ANNUITIES.

Difference of Age 12 years.

AGES.		D_{xy}	N_{xy}	AGES.		D_{xy}	N_{xy}
(x)	(y)			(x)	(y)		
12	0	44888312.	684109069.	66	54	1704341.5	13826284.6
13	1	36689418.	639220757.	67	55	1557603.3	12121943.1
14	2	32579862.	602531339.	68	56	1419210.1	10564339.8
15	3	29414094.	569951477.	69	57	1288907.8	9145129.7
16	4	27303734.	540537383.	70	58	1165047.9	7856221.9
17	5	25574374.	513233649.	71	59	1046732.0	6691174.0
18	6	24218853.	487659275.	72	60	929396.77	5644441.96
19	7	23062938.	463440422.	73	61	812693.30	4715045.19
20	8	22038643.	440377484.	74	62	701356.69	3902351.89
21	9	21105889.	418338841.	75	63	596355.20	3200995.20
22	10	20245411.	397232952.	76	64	503648.93	2604640.00
23	11	19430642.	376987541.	77	65	421184.50	2100991.07
24	12	18641534.	357556899.	78	66	349990.15	1679806.57
25	13	17880345.	338915365.	79	67	289948.90	1329816.42
26	14	17143285.	321035020.	80	68	237155.34	1039867.52
27	15	16430055.	303891735.	81	69	192828.68	802712.18
28	16	15729618.	287461680.	82	70	154197.64	609883.50
29	17	15037079.	271732062.	83	71	122000.45	455685.86
30	18	14355675.	256694983.	84	72	94656.614	333685.410
31	19	13700682.	242339308.	85	73	72040.046	239028.796
32	20	13073568.	228638626.	86	74	53176.350	166988.750
33	21	12475491.	215565058.	87	75	37885.060	113812.400
34	22	11907105.	203089567.	88	76	26075.031	75927.340
35	23	11362889.	191182462.	89	77	17716.790	49852.309
36	24	10841867.	179819573.	90	78	12044.781	32135.519
37	25	10341134.	168977706.	91	79	7705.974	20090.738
38	26	9858314.7	158636571.8	92	80	4711.1777	12384.7637
39	27	9394567.1	148778257.1	93	81	2892.3931	7673.5860
40	28	8942600.4	139383690.0	94	82	1801.7680	4781.1929
41	29	8494684.9	130441089.6	95	83	1127.3868	2979.4249
42	30	8053721.4	121946404.7	96	84	712.5411	1852.0381
43	31	7628906.7	113892683.3	97	85	455.43009	1139.49699
44	32	7224210.4	106263776.6	98	86	283.62602	684.06690
45	33	6840007.7	99039566.2	99	87	174.50149	400.44088
46	34	6476684.4	92199558.5	100	88	108.64456	225.93939
47	35	6131979.0	85722874.1	101	89	64.00544	117.29483
48	36	5806264.5	79590895.1	102	90	34.82262	53.28939
49	37	5499941.5	73784630.6	103	91	14.99949	18.46677
50	38	5209513.4	68284689.1	104	92	3.46729	3.46729
51	39	4934192.6	63075175.7	Difference of Age 93 years.			
52	40	4665928.2	58140983.1	93	0	34556.668	104020.886
53	41	4403148.8	53475054.9	94	1	21027.253	69464.218
54	42	4147933.1	49071906.1	95	2	14076.953	48436.965
55	43	3902175.7	44923973.0	96	3	9797.7768	34360.0116
56	44	3666364.6	41021797.3	97	4	7162.0220	24562.2348
57	45	3440272.1	37355432.7	98	5	5252.8774	17400.2128
58	46	3221844.4	33915160.6	99	6	3935.7160	12147.3354
59	47	3007063.4	30693316.2	100	7	3087.9408	8211.6194
60	48	2795504.5	27686252.8	101	8	2311.2684	5123.6786
61	49	2586636.4	24890748.3	102	9	1592.2764	2812.4102
62	50	2388296.9	22304111.9	103	10	922.8255	1220.1338
63	51	2202046.2	19915815.0	104	11	297.3083	297.3083
64	52	2026747.7	17713768.8	Difference of Age 93 years.			
65	53	1860736.5	15687021.1				

Difference of Age 93 years.

COMMUTATION TABLES FOR JOINT ANNUITIES.

Difference of Age 13 years.

AGES.		D_{xy}	N_{xy}	AGES.		D_{xy}	N_{xy}
(x)	(y)			(x)	(y)		
13	0	43362981.	657096394.	67	54	1584372.8	12483673.4
14	1	35436202.	613733413.	68	55	1445110.7	10899300.6
15	2	31456178.	578297211.	69	56	1313871.4	9454189.9
16	3	28380589.	546841033.	70	57	1189913.6	8140318.5
17	4	26330656.	518460444.	71	58	1072697.9	6950404.9
18	5	24657811.	492129788.	72	59	956439.33	5877707.05
19	6	23349739.	467471977.	73	60	840852.53	4921267.72
20	7	22234212.	444122238.	74	61	727386.42	4080415.19
21	8	21245663.	421888026.	75	62	619530.57	3353028.77
22	9	20348831.	400642363.	76	63	523679.52	2733498.20
23	10	19518263.	380293532.	77	64	438629.19	2209818.68
24	11	18731829.	360775269.	78	65	364986.26	1771189.49
25	12	17970196.	342043440.	79	66	302819.25	1406203.23
26	13	17232587.	324073244.	80	67	248171.24	1103383.98
27	14	16521333.	306840657.	81	68	202221.92	855212.74
28	15	15827598.	290319324.	82	69	162161.20	652990.82
29	16	15138632.	274491726.	83	70	128644.30	490829.62
30	17	14455626.	259353094.	84	71	100575.41	362185.32
31	18	13796741.	244897468.	85	72	77306.868	261609.915
32	19	13165877.	231100727.	86	73	57682.330	184303.047
33	20	12564203.	217934850.	87	74	41639.639	126620.717
34	21	11990386.	205370647.	88	75	28828.830	84981.078
35	22	11442923.	193380261.	89	76	19750.504	56152.248
36	23	10918772.	181937338.	90	77	13494.524	36401.744
37	24	10415012.	171018566.	91	78	8646.944	22907.220
38	25	9930951.4	160603554.1	92	79	5343.9487	14260.2763
39	26	9464300.8	150672602.7	93	80	3293.2505	8916.3276
40	27	9012610.3	141208301.9	94	81	2080.1101	5623.0771
41	28	8569225.8	132195691.6	95	82	1311.9670	3542.9670
42	29	8133659.2	123626465.8	96	83	839.15521	2230.99999
43	30	7706766.6	115492806.6	97	84	541.39892	1391.84478
44	31	7298700.3	107786040.0	98	85	343.90620	850.44586
45	32	6910007.7	100487339.7	99	86	216.35826	506.53966
46	33	6542443.5	93577332.0	100	87	138.61548	290.18140
47	34	6194876.9	87034888.5	101	88	82.04012	151.56592
48	35	5866438.8	80840011.6	102	89	44.38658	69.52580
49	36	5558596.4	74973572.8	103	90	20.28502	25.13922
50	37	5266683.7	69414976.4	104	91	4.85420	4.85420
51	38	4989913.7	64148252.7	Difference of Age 92 years.			
52	39	4722011.3	59158379.0				
53	40	4461165.9	54436367.7	92	0	49435.233	144753.730
54	41	4205869.9	49975201.8	93	1	29238.397	95318.497
55	42	3959077.4	45769331.9	94	2	19332.349	66080.100
56	43	3720618.8	41810254.5	95	3	13163.100	46747.751
57	44	3491945.3	38089635.7	96	4	9426.0163	33584.6515
58	45	3270272.4	34597690.4	97	5	6956.3109	24158.6352
59	46	3052287.3	31327418.0	98	6	5159.3659	17202.3243
60	47	2836933.1	28275130.7	99	7	3887.3743	12042.9584
61	48	2623190.4	25438197.6	100	8	3060.7796	8155.5841
62	49	2421430.0	22815007.2	101	9	2296.0626	5094.8045
63	50	2231995.7	20393577.2	102	10	1584.1839	2798.7419
64	51	2056134.6	18161581.5	103	11	918.6828	1214.5580
65	52	1889458.3	16105446.9	104	12	295.8752	295.8752
66	53	1732315.2	14215988.6				

Difference of Age 92 years.

3. PER CENT.

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COMMUTATION TABLES FOR JOINT ANNUITIES.

Difference of Age 14 years.

AGES.		D _{xy}	N _{xy}	AGES.		D _{xy}	N _{xy}
(x)	(y)			(x)	(y)		
14	0	41881813.	630934556.	68	54	1463946.8	11218879.6
15	1	34214002.	589052743.	69	55	1337849.5	9748932.8
16	2	30350921.	554838741.	70	56	1212959.8	8411083.3
17	3	27369133.	524487820.	71	57	1095592.5	7198123.5
18	4	25386988.	497118687.	72	58	980165.36	6102531.00
19	5	23772944.	471731699.	73	59	865318.73	5122365.64
20	6	22510707.	447958755.	74	60	752589.82	4257046.91
21	7	21434196.	425448048.	75	61	642523.44	3504457.09
22	8	20483592.	404013852.	76	62	544030.58	2861933.65
23	9	19617969.	383530260.	77	63	456073.88	2317903.07
24	10	18816298.	363912291.	78	64	380103.33	1861829.19
25	11	18057240.	345035993.	79	65	315794.23	1481725.86
26	12	17319183.	327038753.	80	66	259187.14	1165931.63
27	13	16607395.	309719570.	81	67	211615.16	906744.49
28	14	15915529.	293112175.	82	68	170060.54	695129.33
29	15	15232931.	277196646.	83	69	135288.16	525068.79
30	16	14553252.	261963715.	84	70	106052.51	389780.63
31	17	13892799.	247410463.	85	71	82140.803	283728.117
32	18	13258187.	233517664.	86	72	61899.466	201587.314
33	19	12652916.	220259477.	87	73	45168.038	139687.848
34	20	12075649.	207606561.	88	74	31685.897	94519.810
35	21	11522956.	195530912.	89	75	21836.367	62833.913
36	22	10995678.	184007956.	90	76	15043.564	40997.546
37	23	10488890.	173012278.	91	77	9687.7138	25953.9823
38	24	10001899.	162523388.	92	78	5996.4938	16266.2685
39	25	9534034.3	152521489.4	93	79	3735.5758	10269.7747
40	26	9079508.8	142987455.1	94	80	2368.3929	6534.1989
41	27	8636312.8	133907946.3	95	81	1514.6432	4165.8060
42	28	8205032.0	125271633.5	96	82	976.54498	2651.16282
43	29	7783260.6	117066601.5	97	83	637.60213	1674.61784
44	30	7373190.2	109283340.9	98	84	408.82333	1037.01571
45	31	6981257.8	101910150.7	99	85	262.34176	628.19238
46	32	6609398.4	94928892.9	100	86	171.86446	365.85062
47	33	6257774.8	88319494.5	101	87	104.67188	193.98616
48	34	5926612.9	82061719.7	102	88	56.89329	89.31428
49	35	5616203.8	76135106.8	103	89	25.85626	32.42099
50	36	5322850.9	70518903.0	104	90	6.56473	6.56473
51	37	5044674.0	65196052.1	Difference of Age 91 years.			
52	38	4775336.2	60151378.1	91	0	71285.606	203783.048
53	39	4514787.8	55376041.9	92	1	41827.151	132497.442
54	40	4261287.6	50861254.1	93	2	26881.632	90670.291
55	41	4014376.3	46599966.5	94	3	18077.324	63788.659
56	42	3774873.1	42585590.2	95	4	12663.648	45711.335
57	43	3543618.5	38810717.1	96	5	9155.2776	33047.6866
58	44	3319392.2	35267098.6	97	6	6832.4747	23892.4090
59	45	3098166.7	31947706.4	98	7	5095.9944	17059.9343
60	46	2879598.4	28849539.7	99	8	3853.1815	11963.9399
61	47	2662065.4	25969941.3	100	9	3040.6429	8110.7584
62	48	2455649.4	23307875.9	101	10	2284.3931	5070.1155
63	49	2262960.4	20852226.5	102	11	1577.0722	2785.7224
64	50	2084099.6	18589266.1	103	12	914.2544	1208.6502
65	51	1916854.6	16505166.5	104	13	294.3958	294.3958
66	52	1759054.8	14588311.9				
67	53	1610377.5	12829257.1				

Difference of Age 91 years.

COMMUTATION TABLES FOR JOINT ANNUITIES.

Difference of Age 15 years.

AGES.		D_{xy}	N_{xy}	AGES.		D_{xy}	N_{xy}
(x)	(y)			(x)	(y)		
15	0	40437303.	605599022.	69	54	1360842.3	10029770.3
16	1	33011845.	565161719.	70	55	1235096.4	8668928.0
17	2	29269244.	532149874.	71	56	1116812.0	7433831.6
18	3	26388247.	502880630.	72	57	1001085.1	6317019.6
19	4	24475954.	476492383.	73	58	886784.36	5315934.50
20	5	22918705.	452016429.	74	59	774487.85	4429150.14
21	6	21700742.	429097724.	75	60	664786.41	3654662.29
22	7	20665362.	407396982.	76	61	564221.40	2989875.88
23	8	19747889.	386731620.	77	62	473797.68	2425654.48
24	9	18912419.	366983731.	78	63	395220.38	1951856.80
25	10	18138667.	348071312.	79	64	328873.84	1556636.42
26	11	17403073.	329932645.	80	65	270292.60	1227762.58
27	12	16690849.	312529572.	81	66	221008.40	957469.98
28	13	15998436.	295838723.	82	67	177959.88	736461.58
29	14	15317559.	279840287.	83	68	141878.43	558501.70
30	15	14643905.	264522728.	84	69	111529.61	416623.27
31	16	13986624.	249878823.	85	70	86613.996	305093.659
32	17	13350496.	235892199.	86	71	65769.987	218479.663
33	18	12741629.	222541703.	87	72	48470.259	152709.676
34	19	12160912.	209800074.	88	73	34370.851	104239.417
35	20	11604896.	197639162.	89	74	24000.449	69868.566
36	21	11072584.	186034266.	90	75	16632.324	45868.117
37	22	10562767.	174961682.	91	76	10799.769	29235.793
38	23	10072846.	164398915.	92	77	6718.2482	18436.0244
39	24	9602146.1	154326068.9	93	78	4191.7239	11717.7762
40	25	9146407.1	144723922.8	94	79	2686.4982	7526.0523
41	26	8700418.0	135577515.7	95	80	1724.5579	4839.5541
42	27	8269267.7	126877097.7	96	81	1127.4043	3114.9962
43	28	7851558.7	118607830.0	97	82	741.99284	1987.59192
44	29	7446373.2	110756271.3	98	83	481.46869	1245.59908
45	30	7052507.9	103309898.1	99	84	311.86245	764.13039
46	31	6677548.9	96257390.2	100	85	208.39152	452.26794
47	32	6321816.4	89579841.3	101	86	129.77899	243.87642
48	33	5986787.2	83258024.9	102	87	72.58799	114.09743
49	34	5673811.4	77271237.7	103	88	33.14172	41.50944
50	35	5378015.2	71597426.3	104	89	8.36772	8.36772
51	36	5098473.6	66219411.1	Difference of Age 90 years.			
52	37	4827741.7	61120937.5	90	0	99297.455	285586.922
53	38	4565772.6	56293195.8	91	1	60314.751	186289.467
54	39	4312507.0	51727423.2	92	2	38455.668	125974.716
55	40	4067270.8	47414916.2	93	3	25136.520	87519.048
56	41	3827599.0	43347645.4	94	4	17391.410	62382.528
57	42	3595291.7	39520046.4	95	5	12299.916	44991.118
58	43	3368512.0	35924754.7	96	6	8992.2957	32691.2016
59	44	3144701.5	32556242.7	97	7	6748.5529	23698.9059
60	45	2922882.0	29411541.2	98	8	5051.1707	16950.3530
61	46	2702100.8	26488659.2	99	9	3827.8316	11899.1823
62	47	2492041.4	23786558.4	100	10	3025.1892	8071.3507
63	48	2294940.3	21294517.0	101	11	2274.1381	5046.1615
64	49	2113012.5	18999576.7	102	12	1569.4701	2772.0234
65	50	1942925.3	16886564.2	103	13	909.6831	1202.5533
66	51	1784560.3	14943638.9	104	14	292.8702	292.8702
67	52	1635234.9	13159078.6				
68	53	1494073.4	11523843.7				

Difference of Age 90 years.

COMMUTATION TABLES FOR JOINT ANNUITIES.

Difference of Age 16 years.

AGES.		$D_{x,y}$	$N_{x,y}$	AGES.		$D_{x,y}$	$N_{x,y}$
(x)	(y)			(x)	(y)		
16	0	39016482.	581071667.	70	54	1256323.2	8914325.2
17	1	31835336.	542055185.	71	55	1137193.8	7658002.0
18	2	28220260.	510219849.	72	56	1020474.1	6520808.2
19	3	25441282.	481999589.	73	57	905711.03	5500334.11
20	4	23596454.	456558307.	74	58	793700.26	4594623.08
21	5	22094060.	432961853.	75	59	684129.63	3800922.82
22	6	20922347.	410867793.	76	60	583771.26	3116793.19
23	7	19923131.	389945446.	77	61	491381.92	2533021.93
24	8	19037667.	370022315.	78	62	410579.31	2041640.01
25	9	18231326.	350984648.	79	63	341953.46	1631060.70
26	10	17481551.	332753322.	80	64	281487.62	1289107.24
27	11	16771696.	315271771.	81	65	230478.01	1007619.62
28	12	16078830.	298500075.	82	66	185859.22	777141.61
29	13	15397350.	282421245.	83	67	148468.71	591282.39
30	14	14725260.	267023895.	84	68	116962.54	442813.68
31	15	14073748.	252298635.	85	69	91087.189	325851.136
32	16	13440658.	238224887.	86	70	69351.665	234763.947
33	17	12830342.	224784229.	87	71	51501.063	165412.282
34	18	12246175.	211953887.	88	72	36883.692	113911.219
35	19	11686835.	199707712.	89	73	26034.163	77027.527
36	20	11151320.	188020877.	90	74	18280.661	50993.364
37	21	10636645.	176869557.	91	75	11940.339	32712.703
38	22	10143794.	166232912.	92	76	7489.4377	20772.3644
39	23	9670257.9	156089117.8	93	77	4696.2511	13282.9267
40	24	9211749.7	146418859.9	94	78	3014.5442	8586.6756
41	25	8764523.2	137207110.2	95	79	1956.1880	5572.1314
42	26	8330648.5	128442587.0	96	80	1283.6515	3615.9434
43	27	7913027.1	120111938.5	97	81	856.61794	2332.29186
44	28	7511715.2	112198911.4	98	82	560.29662	1475.67392
45	29	7122507.9	104687196.2	99	83	367.27847	915.37730
46	30	6745699.3	97564688.3	100	84	247.72834	548.09883
47	31	6387001.5	90818989.0	101	85	157.36145	300.37049
48	32	6048055.4	84431987.5	102	86	89.99930	143.00904
49	33	5731418.8	78383932.1	103	87	42.28426	53.00974
50	34	5433179.5	72652513.3	104	88	10.72548	10.72548
51	35	5151312.5	67219333.8	Difference of Age 89 years.			
52	36	4879227.8	62068021.3				
53	37	4615878.3	57188793.5	89	0	130366.37	391379.786
54	38	4361207.4	52572915.2	90	1	84015.577	261013.416
55	39	4116158.2	48211707.8	91	2	55453.073	176997.839
56	40	3878032.6	44095549.6	92	3	35959.188	121544.766
57	41	3645509.4	40217517.0	93	4	24182.756	85585.578
58	42	3417631.8	36572007.6	94	5	16891.885	61402.822
59	43	3191236.2	33154375.8	95	6	12080.954	44510.937
60	44	2966784.0	29963139.6	96	7	8881.845	32429.983
61	45	2742716.5	26996355.6	97	8	6689.1934	23548.1380
62	46	2529519.8	24253639.1	98	9	5017.9393	16858.9446
63	47	2328950.7	21724119.3	99	10	3808.3770	11841.0053
64	48	2142873.3	19395168.6	100	11	3011.6086	8032.6283
65	49	1969879.6	17252295.3	101	12	2263.1759	5021.0197
66	50	1808831.7	15282415.7	102	13	1561.6227	2757.8438
67	51	1658945.1	13473584.0	103	14	904.9690	1196.2211
68	52	1517135.6	11814638.9	104	15	291.2521	291.2521
69	53	1383178.1	10297503.3				

Difference of Age 89 years.

COMMUTATION TABLES FOR JOINT ANNUITIES.

Difference of Age 17 years.

AGES.		D_{xy}	N_{xy}	AGES.		D_{xy}	N_{xy}
(x)	(y)			(x)	(y)		
17	0	37625973.	557349040.	71	54	1156738.0	7871130.1
18	1	30694385.	519723067.	72	55	1039097.7	6714392.1
19	2	27207552.	489028682.	73	56	923252.84	5675294.38
20	3	24527094.	461821130.	74	57	810640.24	4752041.54
21	4	22747422.	437294036.	75	58	701100.57	3941401.30
22	5	21301557.	414546614.	76	59	600757.19	3240300.73
23	6	20170886.	393245057.	77	60	508407.93	2639543.54
24	7	19206606.	373074171.	78	61	425817.31	2131135.61
25	8	18352063.	353867565.	79	62	355242.34	1705318.30
26	9	17570853.	335515502.	80	63	292682.64	1350075.96
27	10	16847326.	317944649.	81	64	240023.98	1057393.32
28	11	16156712.	301097323.	82	65	193822.78	817369.34
29	12	15474724.	284940611.	83	66	155058.98	623546.56
30	13	14801966.	269465887.	84	67	122395.46	468487.58
31	14	14151935.	254663921.	85	68	95524.306	346092.120
32	15	13524381.	240511986.	86	69	72933.342	250567.814
33	16	12916991.	226987605.	87	70	54305.688	177634.472
34	17	12331439.	214070614.	88	71	39189.998	123328.784
35	18	11768774.	201739175.	89	72	27937.513	84138.786
36	19	11230057.	189970401.	90	73	19829.702	56201.273
37	20	10712282.	178740344.	91	74	13123.680	36371.571
38	21	10214741.	168028062.	92	75	8280.4015	23247.8908
39	22	9738369.8	157813320.8	93	76	5235.3352	14967.4893
40	23	9277092.3	148074951.0	94	77	3377.3831	9732.1541
41	24	8827137.5	138797858.7	95	78	2195.0564	6354.7710
42	25	8392029.1	129970721.2	96	79	1456.0623	4159.7146
43	26	7971763.6	121578692.1	97	80	975.3368	2703.6523
44	27	7570523.0	113606928.5	98	81	646.85279	1728.31551
45	28	7185008.1	106036405.5	99	82	427.41074	1081.46272
46	29	6812654.2	98851397.4	100	83	291.74812	654.05198
47	30	6452186.7	92038743.2	101	84	187.06563	362.30386
48	31	6110417.8	85586556.5	102	85	109.12722	175.23823
49	32	5790073.7	79476138.7	103	86	52.42678	66.11101
50	33	5488343.8	73686065.0	104	87	13.68423	13.68423
51	34	5204151.4	68197721.2	Difference of Age 88 years.			
52	35	4929794.5	62993569.8	88	0	172112.42	530343.26
53	36	4665104.9	58063775.3	89	1	110302.99	358230.84
54	37	4409068.2	53398670.4	90	2	77243.49	247927.85
55	38	4162641.3	48989602.2	91	3	51853.15	170684.36
56	39	3924645.4	44826960.9	92	4	34594.776	118831.209
57	40	3693543.6	40902315.5	93	5	23488.167	84236.433
58	41	3465367.9	37208771.9	94	6	16591.176	60748.266
59	42	3237771.0	33743404.0	95	7	11932.566	44157.090
60	43	3010686.0	30505633.0	96	8	8803.7215	32224.5238
61	44	2783912.3	27494947.0	97	9	6645.1856	23420.8023
62	45	2567541.4	24711034.7	98	10	4992.4361	16775.6167
63	46	2363976.3	22143493.3	99	11	3791.2806	11783.1806
64	47	2174630.1	19779517.0	100	12	2997.0915	7991.9000
65	48	1997717.8	17604886.9	101	13	2251.8600	4994.8085
66	49	1833925.8	15607169.1	102	14	1553.5301	2742.9485
67	50	1681507.9	13773243.3	103	15	899.9692	1189.4184
68	51	1539133.3	12091735.4	104	16	289.4492	289.4492
69	52	1404528.5	10552602.1				
70	53	1276943.5	9148073.6				

Difference of Age 88 years.

COMMUTATION TABLES FOR JOINT ANNUITIES.

Difference of Age 18 years.

AGES.		D _{x,y}	N _{x,y}	AGES.		D _{x,y}	N _{x,y}
(x)	(y)			(x)	(y)		
18	0	36277491.	534422782.	72	54	1056956.0	6898266.3
19	1	29592891.	498145291.	73	55	940102.2	5841310.3
20	2	26229897.	468552400.	74	56	826340.72	4901208.07
21	3	23644577.	442322503.	75	57	716064.19	4074867.35
22	4	21931483.	418677926.	76	58	615659.95	3358803.16
23	5	20536475.	396746443.	77	59	523201.03	2743143.21
24	6	19445450.	376209968.	78	60	440571.56	2219942.18
25	7	18514918.	356764518.	79	61	368426.60	1779370.62
26	8	17687216.	338249600.	80	62	304056.79	1410944.02
27	9	16933388.	320562384.	81	63	249569.96	1106887.23
28	10	16229569.	303628996.	82	64	201850.56	857317.27
29	11	15549679.	287399427.	83	65	161702.83	655466.71
30	12	14876347.	271849748.	84	66	127828.39	493763.88
31	13	14225655.	256973401.	85	67	99961.425	365935.487
32	14	13599516.	242747746.	86	68	76486.135	265974.062
33	15	12997452.	229148230.	87	69	57110.314	189487.927
34	16	12414719.	216150778.	88	70	41324.192	132377.613
35	17	11850714.	203736059.	89	71	29684.422	91053.421
36	18	11308794.	191885345.	90	72	21279.444	61368.999
37	19	10787919.	180576551.	91	73	14235.735	40089.555
38	20	10287378.	169788632.	92	74	9101.0263	25853.8204
39	21	9806481.6	159501253.9	93	75	5788.2419	16752.7941
40	22	9342434.9	149694772.3	94	76	3765.0738	10964.5522
41	23	8889751.9	140352337.4	95	77	2459.2595	7199.4784
42	24	8451982.4	131462585.5	96	78	1633.8608	4740.2189
43	25	8030500.1	123010603.1	97	79	1106.3369	3106.3581
44	26	7626717.0	114980103.0	98	80	736.50025	2000.02122
45	27	7241258.1	107353386.0	99	81	493.43832	1263.52097
46	28	6872435.3	100112127.9	100	82	339.51427	770.08265
47	29	6516228.2	93239692.6	101	83	220.30603	430.56838
48	30	6172780.3	86723464.4	102	84	129.72651	210.26235
49	31	5849775.9	80550684.1	103	85	63.56925	80.53584
50	32	5544511.0	74700908.2	104	86	16.96659	16.96659
51	33	5256990.3	69156397.2	Difference of Age 87 years.			
52	34	4980361.2	63899406.9				
53	35	4713452.5	58919045.7	87	0	226179.46	712265.97
54	36	4456089.3	54205593.2	88	1	145624.32	486086.51
55	37	4208323.0	49749503.9	89	2	101412.00	340462.19
56	38	3968965.7	45541180.9	90	3	72228.969	239050.187
57	39	3737938.9	41572215.2	91	4	49885.667	166821.218
58	40	3511028.6	37834276.3	92	5	33601.128	116935.551
59	41	3282994.9	34323247.7	93	6	23070.032	83334.423
60	42	3054587.9	31040252.8	94	7	16387.390	60264.391
61	43	2825108.2	27985664.9	95	8	11827.608	43877.001
62	44	2606106.1	25160556.7	96	9	8745.8022	32049.3927
63	45	2399509.6	22554450.6	97	10	6611.4121	23303.5905
64	46	2207334.9	20154941.0	98	11	4970.0243	16692.1784
65	47	2027323.4	17947606.1	99	12	3773.0051	11722.1541
66	48	1859842.6	15920282.7	100	13	2982.1060	7949.1490
67	49	1704835.7	14060440.1	101	14	2240.1905	4967.0430
68	50	1560066.7	12355604.4	102	15	1544.9471	2726.8525
69	51	1424893.5	10795537.7	103	16	894.3979	1181.9054
70	52	1296654.1	9370644.2	104	17	287.5075	287.5075
71	53	1175723.8	8073990.1				

Difference of Age 87 years.

COMMUTATION TABLES FOR JOINT ANNUITIES.

Difference of Age 19 years.

AGES.		$D_{x,y}$	$N_{x,y}$	AGES.		$D_{x,y}$	$N_{x,y}$
(x)	(y)			(x)	(y)		
19	0	34975642.	512272989.	73	54	956259.13	5998851.12
20	1	28529522.	477297347.	74	55	841421.44	5042591.99
21	2	25286110.	448767825.	75	56	729932.92	4201170.55
22	3	22796458.	423481715.	76	57	628800.00	3471237.63
23	4	21143777.	400685257.	77	58	536179.87	2842437.63
24	5	19797892.	379541480.	78	59	453390.83	2306257.76
25	6	18745161.	359743588.	79	60	381192.30	1852866.93
26	7	17844171.	340998427.	80	61	315341.37	1471674.63
27	8	17045530.	323154256.	81	62	259268.67	1156333.26
28	9	16312476.	306108726.	82	63	209878.34	897064.59
29	10	15619799.	289796250.	83	64	168400.27	687186.25
30	11	14948405.	274176451.	84	65	133305.49	518785.98
31	12	14297140.	259228046.	85	66	104398.54	385480.49
32	13	13670358.	244930906.	86	67	80038.926	281081.949
33	14	13069660.	231260548.	87	68	59892.322	201043.023
34	15	12492051.	218190888.	88	69	43458.386	141150.701
35	16	11930747.	205698837.	89	70	31300.966	97692.315
36	17	11387531.	193768090.	90	71	22610.030	66391.349
37	18	10863556.	182380559.	91	72	15276.505	43781.319
38	19	10360014.	171517003.	92	73	9872.2161	28504.8139
39	20	9876215.1	161156989.0	93	74	6361.8826	18632.5978
40	21	9407777.4	151280773.9	94	75	4162.7053	12270.7152
41	22	8952366.3	141872996.5	95	76	2741.5585	8108.0099
42	23	8511935.6	132920630.2	96	77	1830.5167	5366.4514
43	24	8087870.5	124408694.6	97	78	1241.4308	3535.9347
44	25	7682911.2	116320824.1	98	79	835.42158	2294.50389
45	26	7295008.1	108637912.9	99	80	561.82404	1459.08231
46	27	6926238.3	101342904.8	100	81	391.96337	897.25827
47	28	6573408.2	94416666.5	101	82	256.37539	505.29490
48	29	6234048.5	87843258.3	102	83	152.77810	248.91951
49	30	5909478.1	81609209.8	103	84	75.56884	96.14141
50	31	5601681.2	75699731.7	104	85	20.57257	20.57257
51	32	5310789.9	70098050.5	Difference of Age 86 years.			
52	33	5030928.0	64787260.6	86	0	288844.92	942541.02
53	34	4761800.1	59756332.6	87	1	191370.44	653696.10
54	35	4502270.7	54994532.5	88	2	133886.25	462325.66
55	36	4253203.2	50492261.8	89	3	94828.498	328439.413
56	37	4012522.0	46239058.6	90	4	69488.359	233610.915
57	38	3780150.9	42226536.6	91	5	48452.826	164122.556
58	39	3553230.1	38446385.7	92	6	33002.961	115669.730
59	40	3326252.6	34893155.6	93	7	22786.667	82666.769
60	41	3097253.2	31566903.0	94	8	16243.249	59880.102
61	42	2866304.1	28469649.8	95	9	11749.795	43636.853
62	43	2644670.8	25603345.7	96	10	8701.3525	31887.0584
63	44	2435550.4	22958674.9	97	11	6581.7324	23185.7059
64	45	2240513.7	20523124.5	98	12	4946.0667	16603.9735
65	46	2057812.8	18282610.8	99	13	3754.1401	11657.9068
66	47	1887405.0	16224798.0	100	14	2966.6522	7903.7667
67	48	1728928.2	14337393.0	101	15	2227.8137	4937.1145
68	49	1581709.6	12608464.8	102	16	1535.3831	2709.3008
69	50	1444273.1	11026755.2	103	17	888.3981	1173.9177
70	51	1315454.9	9582482.1	104	18	285.5196	285.5196
71	52	1193872.0	8267027.2				
72	53	1074304.1	7073155.2				

Difference of Age 86 years.

COMMUTATION TABLES FOR JOINT ANNUITIES.

Difference of Age 20 years.

AGES.		D_{xy}	N_{xy}	AGES.		D_{xy}	N_{xy}
(x)	(y)			(x)	(y)		
20	0	33718854.	490874436.	74	54	855882.41	5176623.00
21	1	27502992.	457155582.	75	55	743254.20	4320740.59
22	2	24379110.	429652590.	76	56	640978.60	3577486.39
23	3	21977685.	405273480.	77	57	547623.59	2936507.79
24	4	20383352.	383295795.	78	58	464637.92	2388884.20
25	5	19084910.	362912443.	79	59	392283.81	1924246.28
26	6	18066073.	343827533.	80	60	326267.71	1531962.47
27	7	17196791.	325761460.	81	61	268891.01	1205694.76
28	8	16420505.	308564669.	82	62	218034.57	936803.75
29	9	15699591.	292144164.	83	63	175097.70	718769.18
30	10	15015813.	276444573.	84	64	138826.76	543671.48
31	11	14366392.	261428760.	85	65	108871.74	404844.72
32	12	13739053.	247062368.	86	66	83591.72	295972.98
33	13	13137742.	233323315.	87	67	62674.328	212381.261
34	14	12561451.	220185573.	88	68	45575.369	149706.933
35	15	12005064.	207624122.	89	69	32917.508	104131.564
36	16	11464436.	195619058.	90	70	23841.319	71214.056
37	17	10939192.	184154622.	91	71	16231.732	47372.737
38	18	10432651.	173215430.	92	72	10593.970	31141.005
39	19	9945948.6	162782778.9	93	73	6900.9666	20547.0352
40	20	9474675.8	152836830.3	94	74	4575.2481	13646.0686
41	21	9014980.6	143362154.5	95	75	3031.0961	9070.8205
42	22	8571888.9	134347173.9	96	76	2040.6423	6039.7244
43	23	8145240.9	125775285.0	97	77	1390.8527	3999.0821
44	24	7737798.4	117630044.1	98	78	937.43422	2608.22939
45	25	7348758.2	109892245.7	99	79	637.28414	1670.79517
46	26	6977650.0	102543487.5	100	80	446.28565	1033.51103
47	27	6624870.1	95565837.5	101	81	295.98097	587.22538
48	28	6288752.3	88940967.4	102	82	177.79153	291.24441
49	29	5968133.1	82652215.1	103	83	88.99695	113.45288
50	30	5658851.6	76684082.0	104	84	24.45593	24.45593
51	31	5365550.2	71025230.4	Difference of Age 85 years.			
52	32	5082414.1	65659680.2	85	0	360741.34	1227319.50
53	33	4810147.7	60577266.1	86	1	244391.69	866578.16
54	34	4548452.2	55767118.4	87	2	175945.00	622186.47
55	35	4297282.0	51218666.2	88	3	125194.57	446241.47
56	36	4055314.1	46921384.2	89	4	91230.385	321046.903
57	37	3821635.0	42866070.1	90	5	67492.480	229816.518
58	38	3593356.2	39044435.1	91	6	47590.271	162324.038
59	39	3366233.2	35451078.9	92	7	32597.593	114733.767
60	40	3138063.5	32084845.7	93	8	22586.238	82136.174
61	41	2906339.5	28946782.2	94	9	16136.385	59549.936
62	42	2683235.5	26040412.7	95	10	11690.078	43413.551
63	43	2471591.3	23357207.2	96	11	8662.2908	31723.4735
64	44	2274166.4	20885615.9	97	12	6550.0058	23061.1827
65	45	2088744.1	18611449.5	98	13	4921.3364	16511.1769
66	46	1915790.1	16522705.4	99	14	3734.6855	11589.8405
67	47	1754550.5	14606915.3	100	15	2950.2619	7855.1550
68	48	1604062.2	12852364.8	101	16	2214.0225	4904.8931
69	49	1464309.7	11248302.6	102	17	1525.0835	2690.8706
70	50	1333346.1	9783992.9	103	18	882.2555	1165.7871
71	51	1211182.6	8450646.8	104	19	283.5316	283.5316
72	52	1090886.8	7239464.2				
73	53	971954.42	6148577.42				

Difference of Age 85 years.

COMMUTATION TABLES FOR JOINT ANNUITIES.

Difference of Age 21 years.

AGES.		D_{xy}	N_{xy}	AGES.		D_{xy}	N_{xy}
(x)	(y)			(x)	(y)		
21	0	32505905.	470202723.	75	54	750028.02	4433971.64
22	1	26516474.	43767118.	76	55	652676.46	3677943.62
23	2	23503493.	411180644.	77	56	558229.96	3025267.16
24	3	21187269.	387677151.	78	57	474554.71	2467037.20
25	4	19649287.	366485882.	79	58	402015.05	1992482.49
26	5	18393514.	346840525.	80	59	335761.09	1590467.44
27	6	17410642.	328447081.	81	60	278207.88	1254706.35
28	7	16566220.	311036439.	82	61	226126.57	976498.47
29	8	15803562.	294470219.	83	62	181902.29	750371.90
30	9	15092519.	278666657.	84	63	144348.02	568469.61
31	10	14431176.	263574138.	85	64	113381.00	424121.59
32	11	13805602.	249142652.	86	65	87173.397	310740.595
33	12	13203761.	235337360.	87	66	65456.336	223567.198
34	13	12626886.	222133599.	88	67	47692.351	158110.862
35	14	12071759.	209506713.	89	68	34521.014	110418.511
36	15	11535849.	197434954.	90	69	25072.607	75897.497
37	16	11013070.	185899105.	91	70	17115.674	50824.890
38	17	10505288.	174886035.	92	71	11256.403	33709.216
39	18	10015682.	164380747.	93	72	7405.494	22452.813
40	19	9541574.2	154365064.9	94	73	4962.9388	15047.3190
41	20	9079085.9	144823490.7	95	74	3331.4913	10084.3802
42	21	8631842.1	135744404.8	96	75	2256.1557	6752.8889
43	22	8202611.4	127112562.7	97	76	1550.5092	4496.7332
44	23	7792685.7	118909951.3	98	77	1050.2664	2946.2240
45	24	7401258.3	111117265.6	99	78	715.10238	1895.95763
46	25	7029061.7	103716007.3	100	79	506.22748	1180.85525
47	26	6674045.0	96686945.6	101	80	337.00103	674.62777
48	27	6337985.7	90012900.6	102	81	205.25726	337.62674
49	28	6020503.5	83674914.9	103	82	103.56788	132.36948
50	29	5715018.8	77654411.4	104	83	28.80160	28.80160
51	30	5420310.5	71939392.6	Difference of Age 84 years.			
52	31	5134819.6	66519082.1				
53	32	4859374.4	61384262.5	84	0	441701.42	1572482.60
54	33	4594633.6	56524888.1	85	1	305223.25	1130781.18
55	34	4341360.8	51930254.5	86	2	224692.46	825557.93
56	35	4097342.0	47588893.7	87	3	164522.94	600865.47
57	36	3862391.3	43491551.7	88	4	120444.27	436342.53
58	37	3632790.4	39629160.4	89	5	88610.021	315898.256
59	38	3404247.5	35996370.0	90	6	66290.981	227288.235
60	39	3175782.1	32592122.5	91	7	47005.729	160997.254
61	40	2944634.3	29416340.4	92	8	32310.868	113991.525
62	41	2720713.9	26471706.1	93	9	22437.644	81680.657
63	42	2507632.2	23750992.2	94	10	16054.374	59243.013
64	43	2307819.1	21243360.0	95	11	11637.599	43188.639
65	44	2120117.2	18935540.9	96	12	8620.535	31551.040
66	45	1944586.6	16815423.7	97	13	6517.2557	22930.5048
67	46	1780937.6	14870837.1	98	14	4895.8333	16413.2491
68	47	1627834.0	13089899.5	99	15	3714.0519	11517.4158
69	48	1485003.1	11462065.5	100	16	2931.9984	7803.3639
70	49	1351843.7	9977062.4	101	17	2199.1704	4871.3655
71	50	1227655.5	8625218.7	102	18	1514.5386	2672.1951
72	51	1106704.1	7397563.2	103	19	876.1128	1157.6565
73	52	986957.28	6290859.12	104	20	281.5437	281.5437
74	53	869930.20	5303901.84				

Difference of Age 84 years.

COMMUTATION TABLES FOR JOINT ANNUITIES.

Difference of Age 22 years.

AGES.		D _{x,y}	N _{x,y}	AGES.		D _{x,y}	N _{x,y}
(x)	(y)			(x)	(y)		
22	0	31339645.	450234516.	76	54	663893.58	3772961.32
23	1	25564090.	418894871.	77	55	568417.65	3109067.74
24	2	22658202.	393330781.	78	56	483745.88	2540650.09
25	3	20424251.	370672579.	79	57	410595.28	2056904.21
26	4	18937445.	350248328.	80	58	344090.18	1646308.93
27	5	17726203.	331310883.	81	59	286302.87	1302218.75
28	6	16772230.	313584680.	82	60	233961.69	1015915.88
29	7	15943801.	296812450.	83	61	188653.31	781954.19
30	8	15192470.	280868649.	84	62	149957.63	593300.88
31	9	14504896.	265676179.	85	63	117890.27	443343.25
32	10	13867857.	251171283.	86	64	90783.958	325452.984
33	11	13267716.	237303426.	87	65	68260.961	234669.026
34	12	12690337.	224035710.	88	66	49809.335	166408.065
35	13	12134643.	211345373.	89	67	36124.522	116598.730
36	14	11599937.	199210730.	90	68	26293.966	80474.208
37	15	11081671.	187610793.	91	69	17999.615	54180.242
38	16	10576235.	176529122.	92	70	11869.399	36180.627
39	17	10085416.	165952887.	93	71	7868.5534	24311.2276
40	18	9608472.6	155867471.0	94	72	5325.7776	16442.6742
41	19	9143191.2	146258998.4	95	73	3613.7904	11116.8966
42	20	8693222.9	137115807.2	96	74	2479.7508	7503.1062
43	21	8259981.8	128422584.3	97	75	1714.2593	5023.3554
44	22	7847573.0	120162602.5	98	76	1170.8267	3309.0961
45	23	7453758.4	112315029.5	99	77	801.17405	2138.26944
46	24	7079277.8	104861271.1	100	78	568.04250	1337.09539
47	25	6723219.7	97781993.3	101	79	382.26455	769.05289
48	26	6385031.1	91058773.6	102	80	233.70390	386.78834
49	27	6067636.9	84673742.5	103	81	119.56733	153.08444
50	28	5765168.2	78606105.6	104	82	33.51711	33.51711
51	29	5474110.1	72840937.4	Difference of Age 83 years.			
52	30	5187225.1	67366827.3	83	0	535794.68	1987967.81
53	31	4909480.1	62179602.2	84	1	373723.57	1452173.13
54	32	4641654.7	57270122.1	85	2	280620.69	1078449.56
55	33	4385439.6	52628467.4	86	3	210105.79	797828.87
56	34	4139369.9	48243027.8	87	4	158280.39	587723.08
57	35	3902419.9	44103657.9	88	5	116984.81	429442.69
58	36	3671532.8	40201238.0	89	6	87032.589	312457.885
59	37	3441606.4	36529705.2	90	7	65476.742	225425.296
60	38	3211645.7	33088098.8	91	8	46592.272	159948.554
61	39	2980027.9	29876453.1	92	9	32098.297	113356.282
62	40	2756562.8	26896425.2	93	10	22323.607	81257.985
63	41	2542657.8	24139862.4	94	11	15982.303	58934.378
64	42	2341471.9	21597204.6	95	12	11581.501	42952.075
65	43	2151490.3	19255732.7	96	13	8577.4324	31370.5738
66	44	1973794.5	17104242.4	97	14	6483.4823	22793.1414
67	45	1807707.1	15130447.9	98	15	4868.7845	16309.6591
68	46	1652315.3	13322740.8	99	16	3691.0602	11440.8746
69	47	1507010.5	11670425.5	100	17	2912.3300	7749.8144
70	48	1370947.9	10163415.0	101	18	2183.9647	4837.4844
71	49	1244686.9	8792467.1	102	19	1503.9937	2653.5197
72	50	1121756.1	7547780.2	103	20	869.9702	1149.5260
73	51	1001267.7	6426024.1	104	21	279.5558	279.5558
74	52	883358.23	5424756.43				
75	53	768436.88	4541398.20				

Difference of Age 83 years.

COMMUTATION TABLES FOR JOINT ANNUITIES.

Difference of Age 23 years.

AGES.		D _{x,y}	N _{x,y}	AGES.		D _{x,y}	N _{x,y}
(x)	(y)			(x)	(y)		
23	0	30214029.	430941025.	77	54	578186.68	3188230.99
24	1	24644691.	400726996.	78	55	492574.24	2610044.31
25	2	21842212.	376082305.	79	56	418547.68	2117470.07
26	3	19684334.	354240093.	80	57	351434.12	1698922.39
27	4	18250401.	334555759.	81	58	293405.07	1347488.27
28	5	17076220.	316305358.	82	59	240769.25	1054083.20
29	6	16142071.	299229138.	83	60	195190.00	813313.95
30	7	15327287.	283087067.	84	61	155523.07	618123.95
31	8	14600955.	267759780.	85	62	122471.68	462600.88
32	9	13938699.	253158825.	86	63	94394.52	340129.20
33	10	13327546.	239220126.	87	64	71088.205	245734.682
34	11	12751806.	225892580.	88	65	51943.528	174646.477
35	12	12195621.	213140774.	89	66	37728.028	122702.949
36	13	11660363.	200945153.	90	67	27515.325	84974.921
37	14	11143236.	189284790.	91	68	18876.428	57459.596
38	15	10642115.	178141554.	92	69	12482.396	38583.168
39	16	10153527.	167499439.	93	70	8297.056	26100.772
40	17	9675371.	157345912.	94	71	5658.794	17803.716
41	18	9207296.3	147670541.3	95	72	3877.9934	12144.9218
42	19	8754603.7	138463245.0	96	73	2689.8763	8266.9284
43	20	8318718.3	129708641.3	97	74	1884.1500	5577.0521
44	21	7902460.3	121389923.0	98	75	1294.4784	3692.9021
45	22	7506258.4	113487462.7	99	76	893.14105	2398.42367
46	23	7129494.0	105981204.3	100	77	636.41364	1505.28262
47	24	6771250.9	98851710.3	101	78	428.94255	868.86898
48	25	6432076.4	92080459.4	102	79	265.09331	439.92643
49	26	6112675.5	85648383.0	103	80	136.13819	174.83312
50	27	5810302.6	79535707.5	104	81	38.69493	38.69493
51	28	5522145.5	73725404.9	Difference of Age 82 years.			
52	29	5238711.2	68203259.4	82	0	642222.59	2482250.34
53	30	4959585.8	62964548.2	83	1	453335.88	1840027.75
54	31	4689515.5	58004962.4	84	2	343599.53	1386691.87
55	32	4430319.8	53315446.9	85	3	262403.25	1043092.34
56	33	4181397.9	48885127.1	86	4	202133.67	780689.09
57	34	3942448.4	44703729.2	87	5	153734.18	578555.42
58	35	3709583.3	40761280.8	88	6	114902.25	424821.24
59	36	3478309.8	37051697.5	89	7	85963.584	309918.986
60	37	3246890.9	33573387.7	90	8	64900.817	223955.402
61	38	3013680.8	30326496.8	91	9	46285.744	159054.585
62	39	2789695.9	27312816.0	92	10	31935.160	112768.841
63	40	2576160.6	24523120.1	93	11	22223.393	80833.681
64	41	2374176.6	21946959.5	94	12	15905.262	58610.288
65	42	2182863.5	19572782.9	95	13	11523.594	42705.026
66	43	2003002.4	17389919.4	96	14	8532.9828	31181.4317
67	44	1834859.0	15386917.0	97	15	6447.6619	22648.4489
68	45	1677151.5	13552058.0	98	16	4838.6444	16200.7870
69	46	1529674.8	11874906.5	99	17	3666.2998	11362.1426
70	47	1391264.9	10345231.7	100	18	2892.1932	7695.8428
71	48	1262276.7	8953966.8	101	19	2168.7590	4803.6496
72	49	1137318.4	7691690.1	102	20	1493.4489	2634.8906
73	50	1014885.7	6554371.7	103	21	863.8276	1141.4417
74	51	896166.51	5539486.02	104	22	277.6141	277.6141
75	52	780298.30	4643319.51				
76	53	674790.22	3863021.21				

Difference of Age 82 years.

COMMUTATION TABLES FOR JOINT ANNUITIES.

Difference of Age 24 years.

AGES.		D _{x,y}	N _{x,y}	AGES.		D _{x,y}	N _{x,y}
(x)	(y)			(x)	(y)		
24	0	29127397.	412299385.	78	54	501039.80	2675511.83
25	1	23757161.	383171988.	79	55	426186.17	2174472.03
26	2	21050926.	359414827.	80	56	358240.69	1748285.86
27	3	18970193.	338363901.	81	57	299667.23	1390045.17
28	4	17581196.	319393708.	82	58	246741.92	1090377.94
29	5	16434640.	301812512.	83	59	200869.43	843636.02
30	6	15517890.	285377872.	84	60	160911.83	642766.59
31	7	14730522.	269859982.	85	61	127017.03	481854.76
32	8	14031008.	255129460.	86	62	98062.85	354837.73
33	9	13395628.	241098452.	87	63	73915.448	256774.880
34	10	12809309.	227702824.	88	64	54094.934	182859.432
35	11	12254694.	214893515.	89	65	39344.570	128764.498
36	12	11718957.	202638821.	90	66	28736.683	89419.928
37	13	11201283.	190919864.	91	67	19753.241	60683.245
38	14	10701238.	179718581.	92	68	13090.450	40930.004
39	15	10216774.	169017343.	93	69	8725.5586	27839.5539
40	16	9740713.6	158800568.6	94	70	5966.9585	19113.9953
41	17	9271401.5	149059855.0	95	71	4120.4811	13147.0368
42	18	8815984.4	139788453.5	96	72	2886.5323	9026.5557
43	19	8377454.8	130972469.1	97	73	2043.8066	6140.0234
44	20	7958654.4	122595014.3	98	74	1422.7670	4096.2168
45	21	7558758.5	114636359.9	99	75	987.46618	2673.44976
46	22	7179710.1	107077601.4	100	76	709.46775	1685.98358
47	23	6819282.1	99897891.3	101	77	480.57125	976.51583
48	24	6478027.5	93078609.2	102	78	297.46363	495.94458
49	25	6157714.0	86600581.7	103	79	154.42328	198.48095
50	26	5853430.9	80442867.7	104	80	44.05767	44.05767
51	27	5565377.3	74589436.8	Difference of Age 81 years.			
52	28	5284680.9	69024059.5	81	0	763677.96	3066326.01
53	29	5008812.5	63739378.6	82	1	543384.53	2302648.05
54	30	4737376.3	58730566.1	83	2	416794.68	1759263.52
55	31	4476001.5	53993189.8	84	3	321293.61	1342468.84
56	32	4224190.0	49517188.3	85	4	252446.79	1021175.23
57	33	3982477.0	45292998.3	86	5	196327.89	768728.44
58	34	3747633.9	41310521.3	87	6	150997.41	572400.55
59	35	3514357.9	37562887.4	88	7	113490.93	421403.14
60	36	3281517.8	34048529.5	89	8	85207.459	307912.212
61	37	3046753.6	30767011.7	90	9	64473.837	222704.753
62	38	2821199.5	27720258.1	91	10	46050.501	158230.916
63	39	2607125.3	24899058.6	92	11	31791.798	112180.415
64	40	2405459.5	22291933.3	93	12	22116.267	80388.617
65	41	2213352.9	19886473.8	94	13	15825.736	58272.350
66	42	2032210.2	17673120.9	95	14	11463.877	42446.614
67	43	1862011.0	15640910.7	96	15	8485.8392	30982.7368
68	44	1702342.5	13778899.7	97	16	6407.7478	22496.8976
69	45	1552667.5	12076557.2	98	17	4806.1858	16089.1498
70	46	1412188.5	10523889.7	99	18	3640.9499	11282.9640
71	47	1280983.3	9111701.2	100	19	2872.0565	7642.0141
72	48	1153390.8	7830717.9	101	20	2153.5533	4769.9576
73	49	1028965.3	6677327.1	102	21	1482.9040	2616.4043
74	50	908355.04	5648361.85	103	22	857.8278	1133.5003
75	51	791612.26	4740006.81	104	23	275.6725	275.6725
76	52	685206.13	3948394.55				
77	53	587676.59	3263188.42				

Difference of Age 81 years.

COMMUTATION TABLES FOR JOINT ANNUITIES.

Difference of Age 25 years.

AGES.		$D_{x,y}$	$N_{x,y}$	AGES.		$D_{x,y}$	$N_{x,y}$
(x)	(y)			(x)	(y)		
25	0	28078432.	394287039.	79	54	433510.76	2228176.32
26	1	22896502.	366208607.	80	55	364778.58	1794665.56
27	2	20287206.	343312105.	81	56	305471.18	1429886.98
28	3	18274595.	323024899.	82	57	252008.14	1124415.80
29	4	16920643.	304750304.	83	58	205852.32	872407.66
30	5	15799146.	287829661.	84	59	165593.86	666555.34
31	6	14913705.	272030515.	85	60	131418.07	500961.48
32	7	14155518.	257116810.	86	61	101702.30	369543.41
33	8	13484340.	242961292.	87	62	76787.927	267841.108
34	9	12874744.	229476952.	88	63	56246.339	191053.181
35	10	12309955.	216602208.	89	64	40974.150	134806.842
36	11	11775721.	204292253.	90	65	29967.972	93832.692
37	12	11257571.	192516532.	91	66	20630.054	63864.720
38	13	10756982.	181258961.	92	67	13698.503	43234.666
39	14	10273534.	170501979.	93	68	9150.6057	29536.1635
40	15	9801388.8	160228444.9	94	69	6275.1229	20385.5578
41	16	9334015.8	150427056.1	95	70	4344.8726	14110.4349
42	17	8877365.0	141093040.3	96	71	3067.0247	9765.5623
43	18	8436191.3	132215675.3	97	72	2193.2284	6698.5376
44	19	8014848.5	123779484.0	98	73	1543.3274	4505.3092
45	20	7612508.5	115764635.5	99	74	1085.3285	2961.9818
46	21	7229926.3	108152127.0	100	75	784.39503	1876.65330
47	22	6867313.2	100922200.7	101	76	535.73616	1092.25827
48	23	6523978.7	94054887.5	102	77	333.26716	556.52211
49	24	6201705.2	87530908.8	103	78	173.27978	223.25495
50	25	5896559.4	81329203.6	104	79	49.97517	49.97517
51	26	5606687.7	75432644.2	Difference of Age 80 years.			
52	27	5326053.7	69825956.5	80	0	895601.73	3746038.85
53	28	5052764.9	64499902.8	81	1	646147.92	2850437.12
54	29	4784397.4	59447137.9	82	2	499584.95	2204289.20
55	30	4521683.2	54662740.5	83	3	389737.05	1704704.25
56	31	4267746.2	50141057.3	84	4	309102.65	1314967.20
57	32	4023233.3	45873311.1	85	5	245195.89	1005864.55
58	33	3785684.5	41850077.8	86	6	192832.87	760668.66
59	34	3550406.0	38064393.3	87	7	149142.74	567835.79
60	35	3315526.4	34513987.3	88	8	112492.68	418693.05
61	36	3079246.1	31198460.9	89	9	84646.884	306200.368
62	37	2852159.9	28119214.8	90	10	64146.156	221553.484
63	38	2636567.1	25267054.9	91	11	45843.773	157407.328
64	39	2434372.4	22630487.8	92	12	31638.549	111563.555
65	40	2242516.6	20196115.4	93	13	22005.686	79925.006
66	41	2060595.4	17953598.8	94	14	15743.724	57919.320
67	42	1889162.9	15893003.4	95	15	11400.540	42175.596
68	43	1727533.5	14003840.5	96	16	8433.3078	30775.0562
69	44	1575988.7	12276307.0	97	17	6364.7634	22341.7484
70	45	1433415.3	10700318.3	98	18	4772.9544	15976.9850
71	46	1300248.3	9266903.0	99	19	3615.6001	11204.0306
72	47	1170483.8	7966654.7	100	20	2851.9198	7588.4305
73	48	1043506.5	6796170.9	101	21	2138.3476	4736.5107
74	49	920956.73	5752664.39	102	22	1472.6043	2598.1631
75	50	802378.76	4831707.66	103	23	851.8280	1125.5588
76	51	695141.29	4029328.90	104	24	273.7308	273.7308
77	52	596747.82	3334187.61				
78	53	509263.47	2737439.79				

Difference of Age 80 years.

COMMUTATION TABLES FOR JOINT ANNUITIES.

Difference of Age 26 years.

AGES.		D _{xy}	N _{xy}	AGES.		D _{xy}	N _{xy}
(x)	(y)			(x)	(y)		
26	0	27061224.	376881180.	80	54	371047.80	1838301.72
27	1	22065824.	349819956.	81	55	311046.03	1467253.92
28	2	19543315.	327754132.	82	56	256889.04	1156207.89
29	3	17587991.	308210817.	83	57	210245.83	899318.85
30	4	16266356.	290622826.	84	58	169701.69	689073.02
31	5	15184010.	274356470.	85	59	135241.93	519371.33
32	6	14331550.	259172460.	86	60	105226.20	384129.40
33	7	13604000.	244840910.	87	61	79637.788	278903.201
34	8	12960007.	231236910.	88	62	58432.167	199265.413
35	9	12372839.	218276903.	89	63	42603.729	140833.246
36	10	11828823.	205904064.	90	64	31209.190	98229.517
37	11	11312099.	194075241.	91	65	21513.996	67020.327
38	12	10811037.	182763142.	92	66	14306.556	45506.331
39	13	10327051.	171952105.	93	67	9575.6528	31199.7755
40	14	9855841.	161625054.	94	68	6580.8022	21624.1227
41	15	9392157.8	151769213.3	95	69	4569.2642	15043.3205
42	16	8937318.3	142377055.5	96	70	3234.0476	10474.0563
43	17	8494927.6	133439737.2	97	71	2330.3693	7240.0087
44	18	8071042.6	124944809.6	98	72	1656.1595	4909.6394
45	19	7666258.5	116873767.0	99	73	1177.2955	3253.4799
46	20	7281338.0	109207508.5	100	74	862.13209	2076.18445
47	21	6915344.4	101926170.5	101	75	592.31557	1214.05236
48	22	6569930.0	95010826.1	102	76	371.52300	621.73679
49	23	6245696.3	88440896.1	103	77	194.13620	250.21379
50	24	5938684.8	82195199.8	104	78	56.07759	56.07759
51	25	5647998.2	76256515.0	Difference of Age 79 years.			
52	26	5365587.6	70608516.8	79	0	1046369.2	4536026.95
53	27	5092322.0	65242929.2	80	1	757768.62	3489657.75
54	28	4826380.5	60150607.2	81	2	594065.08	2731889.13
55	29	4566563.4	55324226.7	82	3	467152.71	2137824.05
56	30	4311302.4	50757663.3	83	4	374949.12	1670671.34
57	31	4064717.5	46446360.9	84	5	300224.45	1295722.22
58	32	3824426.8	42381643.4	85	6	240830.92	995497.77
59	33	3586454.0	38557216.6	86	7	190464.34	754666.85
60	34	3349535.0	34970762.6	87	8	147830.89	564202.51
61	35	3111158.4	31621227.6	88	9	111752.59	416371.62
62	36	2882577.1	28510069.2	89	10	84216.675	304619.034
63	37	2665501.3	25627492.1	90	11	63858.193	220402.359
64	38	2461863.3	22961990.8	91	12	45622.788	156544.166
65	39	2269471.0	20500127.5	92	13	31480.356	110921.378
66	40	2087746.3	18230656.5	93	14	21891.649	79441.022
67	41	1915550.0	16142910.2	94	15	15656.742	57549.373
68	42	1752724.4	14227360.2	95	16	11329.966	41892.631
69	43	1599310.0	12474635.8	96	17	8376.7355	30562.6648
70	44	1454945.3	10875325.8	97	18	6320.7555	22185.9293
71	45	1319792.5	9420380.5	98	19	4739.7230	15865.1738
72	46	1188086.9	8100588.0	99	20	3590.2502	11125.4508
73	47	1058971.0	6912501.1	100	21	2831.7831	7535.2006
74	48	933971.6	5853530.1	101	22	2123.4955	4703.4175
75	49	813510.24	4919558.48	102	23	1462.3047	2579.9220
76	50	704595.72	4106048.24	103	24	845.8282	1117.6173
77	51	605400.39	3401452.52	104	25	271.7891	271.7891
78	52	517124.34	2796052.13				
79	53	440626.07	2278927.79				

Difference of Age 79 years.

COMMUTATION TABLES FOR JOINT ANNUITIES.

Difference of Age 27 years.

AGES.		D_{xy}	N_{xy}	AGES.		D_{xy}	N_{xy}
(x)	(y)			(x)	(y)		
27	0	26079452.	360064268.	81	54	316391.78	1502364.37
28	1	21256716.	333984816.	82	55	261577.26	1185972.59
29	2	18809043.	312728100.	83	56	214317.87	924395.33
30	3	16907899.	293919057.	84	57	173323.64	710077.46
31	4	15633029.	277011158.	85	58	138596.82	536753.82
32	5	14591304.	261378129.	86	59	108287.96	398157.00
33	6	13773173.	246786825.	87	60	82397.178	289869.040
34	7	13075013.	233013652.	88	61	60600.783	207471.862
35	8	12454778.	219938639.	89	62	44259.382	146871.079
36	9	11889248.	207483861.	90	63	32450.408	102611.697
37	10	11363110.	195594613.	91	64	22405.066	70161.289
38	11	10863403.	184231503.	92	65	14919.553	47756.223
39	12	10378945.	173368100.	93	66	10000.700	32836.670
40	13	9907181.6	162989154.8	94	67	6886.4814	22835.9698
41	14	9444336.5	153081973.2	95	68	4791.8463	15949.4884
42	15	8992989.2	143637636.7	96	69	3401.0705	11157.6421
43	16	8552298.1	134644647.5	97	70	2457.2756	7756.5716
44	17	8127236.8	126092349.4	98	71	1759.7178	5299.2960
45	18	7720008.6	117965112.6	99	72	1263.3672	3539.5782
46	19	7332749.8	110245104.0	100	73	935.1862	2276.2110
47	20	6964519.1	102912354.2	101	74	651.01668	1341.02482
48	21	6615881.2	95947835.1	102	75	410.75975	690.00814
49	22	628967.4	89331953.9	103	76	216.42115	279.24839
50	23	5980810.3	83042266.5	104	77	62.82724	62.82724
51	24	5688347.9	77061456.2	Difference of Age 78 years.			
52	25	5405121.6	71373108.3	78	0	1209364.7	5443112.04
53	26	5130121.0	65967986.7	79	1	885332.99	4233747.34
54	27	4864165.3	60837865.7	80	2	696688.59	3348414.35
55	28	4606635.0	55973700.4	81	3	555499.35	2651725.76
56	29	4354094.5	51367065.4	82	4	449427.37	2096226.41
57	30	4106201.6	47012970.9	83	5	364179.64	1646793.04
58	31	3863861.0	42906769.3	84	6	294879.87	1282619.40
59	32	3623157.5	39042908.3	85	7	237872.84	987739.53
60	33	3383543.6	35419750.8	86	8	188789.04	749866.69
61	34	3143070.7	32036207.2	87	9	146858.32	561077.65
62	35	2912451.2	28893136.5	88	10	111184.62	414219.33
63	36	2693927.9	25980685.3	89	11	83838.613	303034.710
64	37	2488880.3	23286757.4	90	12	63550.371	219196.097
65	38	2295099.8	20797877.1	91	13	45394.674	155645.726
66	39	2112840.4	18502777.3	92	14	31317.220	110251.052
67	40	1940789.8	16389936.9	93	15	21770.701	78933.832
68	41	1777205.8	14449147.1	94	16	15559.820	57163.131
69	42	1622631.2	12671941.3	95	17	11253.962	41603.311
70	43	1476475.4	11049310.1	96	18	8318.8164	30349.3487
71	44	1339615.9	9572834.7	97	19	6276.7477	22030.5323
72	45	1205945.2	8233218.8	98	20	4706.4916	15753.7846
73	46	1074897.1	7027273.6	99	21	3564.9003	11047.2930
74	47	947812.8	5952376.5	100	22	2812.1147	7482.3927
75	48	825006.67	5004563.72	101	23	2108.6434	4670.2780
76	49	714370.65	4179557.05	102	24	1452.0050	2561.6346
77	50	613634.28	3465186.40	103	25	839.8284	1109.6296
78	51	524622.40	2851552.12	104	26	269.8012	269.8012
79	52	447427.46	2326929.72				
80	53	377137.89	1879502.26				

Difference of Age 78 years.

COMMUTATION TABLES FOR JOINT ANNUITIES.

Difference of Age 28 years.

AGES.		D _{xy}	N _{xy}	AGES.		D _{xy}	N _{xy}
(x)	(y)			(x)	(y)		
28	0	25123172.	343812896.	82	54	266072.82	1213909.18
29	1	20458068.	318689724.	83	55	218229.17	947836.36
30	2	18081736.	298231656.	84	56	176680.57	729607.19
31	3	16249594.	280149920.	85	57	141554.90	552926.62
32	4	15022796.	263900326.	86	58	110974.22	411371.72
33	5	14022806.	248877530.	87	59	84794.68	300397.50
34	6	13237608.	234854724.	88	60	62700.555	215602.825
35	7	12565301.	221617116.	89	61	45901.999	152902.270
36	8	11967985.	209051815.	90	62	33711.486	107000.271
37	9	11421157.	197083830.	91	63	23296.136	73288.785
38	10	10912391.	185662673.	92	64	15537.494	49992.649
39	11	10429218.	174750282.	93	65	10429.202	34455.155
40	12	9956966.4	164321064.1	94	66	7192.1607	24025.9531
41	13	9493533.4	154364097.7	95	67	5014.4282	16833.7924
42	14	9042950.3	144870564.3	96	68	3566.7464	11819.3642
43	15	8605570.7	135827614.0	97	69	2584.1820	8252.6178
44	16	8182124.0	127222043.3	98	70	1855.5478	5668.4358
45	17	7773758.7	119039919.3	99	71	1342.3645	3812.8880
46	18	7384161.4	111266160.6	100	72	1003.5573	2470.5235
47	19	7013693.9	103881999.2	101	73	706.1816	1466.9662
48	20	6662926.5	96868305.3	102	74	451.4679	760.7846
49	21	6333678.6	90205378.8	103	75	239.2775	309.3167
50	22	6022935.7	83871700.2	104	76	70.0392	70.0392
51	23	5728697.6	77848764.5	Difference of Age 77 years.			
52	24	5443736.2	72120066.9	77	0	1395574.9	6485644.37
53	25	5167920.1	66676330.7	78	1	1023243.5	5090069.47
54	26	4900270.8	61508410.6	79	2	813970.59	4066825.97
55	27	4642699.5	56608139.8	80	3	651460.70	3252855.38
56	28	4392301.7	51965440.3	81	4	534421.84	2601394.68
57	29	4146958.0	47573138.6	82	5	436518.69	2066972.84
58	30	3903295.3	43426180.6	83	6	357696.53	1630454.15
59	31	3660516.4	39522885.3	84	7	291257.92	1272757.62
60	32	3418170.5	35862368.9	85	8	235780.54	981499.70
61	33	3174983.0	32444198.4	86	9	187547.01	745719.16
62	34	2942325.3	29269215.4	87	10	146111.93	558172.15
63	35	2721846.9	26326890.1	88	11	110685.50	412060.22
64	36	2515423.3	23605043.2	89	12	83434.477	301374.723
65	37	2320286.7	21089619.9	90	13	63232.619	217940.246
66	38	2136700.4	18769333.2	91	14	45159.431	154707.627
67	39	1964117.5	16632632.8	92	15	31144.197	109548.196
68	40	1800622.8	14668515.3	93	16	21635.930	78403.999
69	41	1645295.5	12867892.5	94	17	15455.441	56768.069
70	42	1498005.4	11222597.0	95	18	11176.149	41312.628
71	43	1359439.4	9724591.6	96	19	8260.8972	30136.4794
72	44	1224058.7	8365152.2	97	20	6232.7399	21875.5822
73	45	1091054.0	7141093.5	98	21	4673.2603	15642.8423
74	46	962067.19	6050039.49	99	22	3540.1400	10969.5820
75	47	837233.06	5087972.30	100	23	2792.4463	7429.4420
76	48	724466.05	4250739.24	101	24	2093.7913	4636.9957
77	49	622147.29	3526273.19	102	25	1441.7054	2543.2044
78	50	531757.66	2904125.90	103	26	833.6857	1101.4990
79	51	453914.97	2372368.24	104	27	267.8133	267.8133
80	52	382959.30	1918453.27				
81	53	321584.79	1535493.97				

Difference of Age 77 years.

COMMUTATION TABLES FOR JOINT ANNUITIES.

Difference of Age 29 years.

AGES.		D_{xy}	N_{xy}	AGES.		D_{xy}	N_{xy}
(x)	(y)			(x)	(y)		
29	0	24179256.	328112265.	83	54	221979.74	969821.21
30	1	19666996.	303933009.	84	55	179904.99	747841.47
31	2	17377727.	284266013.	85	56	144296.54	567936.48
32	3	15615293.	266888286.	86	57	113342.75	423639.94
33	4	14437487.	251272993.	87	58	86898.149	310297.192
34	5	13477535.	236835506.	88	59	64524.946	223399.043
35	6	12721557.	223357971.	89	60	47492.468	158874.097
36	7	12074188.	210636414.	90	61	34962.634	111381.629
37	8	11496794.	198562226.	91	62	24201.463	76418.995
38	9	10968135.	187065432.	92	63	16155.434	52217.532
39	10	10476248.	176097297.	93	64	10861.161	36062.098
40	11	10005195.	165621049.	94	65	7500.3252	25200.9368
41	12	9541239.7	155615854.1	95	66	5237.0102	17700.6116
42	13	9090056.4	146074614.4	96	67	3732.4223	12463.6014
43	14	8653379.4	136984558.0	97	68	2710.0648	8731.1791
44	15	8233090.7	128331178.6	98	69	1951.3779	6021.1143
45	16	7826258.8	120098087.9	99	70	1415.4664	4069.7364
46	17	7435573.2	112271829.1	100	71	1066.3089	2654.2700
47	18	7062868.6	104836255.9	101	72	757.81029	1587.96107
48	19	6709971.8	97773387.3	102	73	489.72371	830.15078
49	20	6378717.2	91063415.5	103	74	262.99099	340.42707
50	21	6065061.2	84684698.3	104	75	77.43608	77.43608
51	22	5769047.3	78619637.1	Difference of Age 76 years.			
52	23	5482350.8	72850589.8	76	0	1602446.5	7677773.5
53	24	5204840.1	67368239.0	77	1	1180795.9	6075327.0
54	25	4936376.3	62163398.9	78	2	940764.8	4894531.1
55	26	4677161.1	57227022.6	79	3	761128.95	3953766.26
56	27	4426688.2	52549861.5	80	4	626742.09	3192637.31
57	28	4183347.5	48123173.3	81	5	519071.91	2565895.22
58	29	3942037.7	43939825.8	82	6	428747.80	2046823.31
59	30	3697875.3	39997788.1	83	7	353303.01	1618075.51
60	31	3453415.7	36299912.8	84	8	288696.05	1264772.50
61	32	3207475.5	32846497.1	85	9	234229.35	976076.45
62	33	2972199.4	29639021.6	86	10	186593.82	741847.10
63	34	2749765.9	26666822.2	87	11	145456.01	555253.28
64	35	2541492.3	23917056.3	88	12	110151.95	409797.27
65	36	2345031.7	21375564.0	89	13	83017.304	299645.324
66	37	2160149.0	19030532.3	90	14	62904.938	216628.020
67	38	1986298.0	16870383.3	91	15	44909.932	153723.082
68	39	1822265.7	14884085.3	92	16	30951.399	108813.150
69	40	1666974.3	13061819.6	93	17	21490.792	77861.751
70	41	1518929.0	11394845.3	94	18	15348.578	56370.959
71	42	1379262.8	9875916.3	95	19	11098.336	41022.381
72	43	1242172.1	8496653.5	96	20	8202.9779	29924.0448
73	44	1107441.8	7254481.4	97	21	6188.7320	21721.0669
74	45	976528.15	6147039.60	98	22	4640.8017	15532.3349
75	46	849824.40	5170511.45	99	23	3515.3796	10891.5332
76	47	735202.45	4320687.05	100	24	2772.7779	7376.1536
77	48	630939.41	3585484.60	101	25	2078.9392	4603.3757
78	49	539134.78	2954545.19	102	26	1431.1605	2524.4365
79	50	460088.54	2415410.41	103	27	827.5431	1093.2760
80	51	388512.03	1955321.87	104	28	265.7329	265.7329
81	52	326548.70	1566809.84				
82	53	270439.93	1240261.14				

Difference of Age 76 years.

COMMUTATION TABLES FOR JOINT ANNUITIES.

Difference of Age 30 years.

AGES.		D _{x,y}	N _{x,y}	AGES.		D _{x,y}	N _{x,y}
(x)	(y)			(x)	(y)		
30	0	23244293.	312961542.	84	54	182996.90	764934.60
31	1	18901266.	289717249.	85	55	146929.95	581937.70
32	2	16699390.	270815983.	86	56	115537.97	435007.75
33	3	15006899.	254116593.	87	57	88752.82	319469.78
34	4	13876091.	239109694.	88	58	66125.592	230716.963
35	5	12952131.	225233603.	89	59	48874.352	164591.371
36	6	12224337.	212281472.	90	60	36174.063	115717.019
37	7	11598816.	200057135.	91	61	25099.662	79542.956
38	8	11040772.	188458319.	92	62	16783.262	54443.294
39	9	10529764.	177417547.	93	63	11293.119	37660.032
40	10	10050313.	166887783.	94	64	7810.9748	26366.9128
41	11	9587455.1	156837469.9	95	65	5461.4018	18555.9380
42	12	9135735.0	147250014.8	96	66	3898.0982	13094.5362
43	13	8698456.2	138114279.8	97	67	2835.9478	9196.4380
44	14	8278830.1	129415823.6	98	68	2046.4351	6360.4902
45	15	7875008.8	121136993.5	99	69	1488.5684	4314.0551
46	16	7485789.3	113261984.7	100	70	1124.3776	2825.4867
47	17	7112043.4	105776195.4	101	71	805.19555	1701.10909
48	18	6757017.2	98664152.0	102	72	525.52725	895.91354
49	19	6423755.7	91907134.8	103	73	285.27594	370.38629
50	20	6108189.6	85483379.1	104	74	85.11035	85.11035
51	21	5809397.0	79375189.5	Difference of Age 75 years.			
52	22	5520965.3	73565792.5	75	0	1824832.3	9028274.2
53	23	5241760.1	68044827.2	76	1	1355830.0	7203441.9
54	24	4971642.1	62803067.1	77	2	1085617.7	5847611.9
55	25	4711622.7	57831425.0	78	3	879691.88	4761994.16
56	26	4459546.4	53119802.3	79	4	732249.17	3882302.28
57	27	4216098.2	48660255.9	80	5	608740.50	3150053.11
58	28	3976629.1	44444157.7	81	6	509831.41	2541312.61
59	29	3734578.8	40467528.6	82	7	423481.57	2031481.20
60	30	3488661.0	36732949.8	83	8	350195.40	1607999.63
61	31	3240548.2	33244288.8	84	9	286796.73	1257804.23
62	32	3002616.6	30003740.6	85	10	233038.91	971007.50
63	33	2777684.9	27001124.0	86	11	185756.17	737968.59
64	34	2567561.4	24223439.1	87	12	144754.85	552212.42
65	35	2369334.8	21655877.7	88	13	109601.19	407457.57
66	36	2183186.2	19286542.9	89	14	82587.095	297856.378
67	37	2008096.0	17103356.7	90	15	62557.397	215269.283
68	38	1842844.3	15095260.7	91	16	44631.918	152711.886
69	39	1687010.9	13252416.4	92	17	30743.771	108079.968
70	40	1538942.8	11565405.5	93	18	21342.198	77336.197
71	41	1398527.8	10026462.7	94	19	15241.714	55993.999
72	42	1260285.5	8627934.9	95	20	11020.522	40752.285
73	43	1123829.5	7367649.4	96	21	8145.0586	29731.7633
74	44	991195.7	6243819.9	97	22	6145.7476	21586.7047
75	45	862598.22	5252624.19	98	23	4608.3431	15440.9571
76	46	746259.33	4390025.97	99	24	3490.6193	10832.6140
77	47	640289.76	3643766.64	100	25	2773.1095	7341.9947
78	48	546753.78	3003476.88	101	26	2063.7335	4568.8852
79	49	466471.40	2456723.10	102	27	1420.6156	2505.1517
80	50	393796.08	1990251.70	103	28	821.1147	1084.5361
81	51	331283.50	1596455.62	104	29	263.4214	263.4214
82	52	274614.38	1265172.12				
83	53	225623.14	990557.74				

Difference of Age 75 years.

COMMUTATION TABLES FOR JOINT ANNUITIES.

Difference of Age 31 years.

AGES.		D_{xy}	N_{xy}	AGES.		D_{xy}	N_{xy}
(x)	(y)			(x)	(y)		
31	0	22339282.	298366513.	85	54	149455.14	595058.31
32	1	18163458.	276027231.	86	55	117646.53	445603.17
33	2	16048758.	257863773.	87	56	90471.784	327956.639
34	3	14423361.	241815015.	88	57	67536.914	237484.855
35	4	13335149.	227391654.	89	58	50086.759	169947.941
36	5	12445899.	214056505.	90	59	37226.616	119861.182
37	6	11743053.	201610606.	91	60	25969.346	82634.566
38	7	11138747.	189867553.	92	61	17406.145	56665.220
39	8	10599498.	178728806.	93	62	11731.989	39259.075
40	9	10101653.	168129308.	94	63	8121.6244	27527.0860
41	10	9630688.8	158027655.4	95	64	5687.6030	19405.4616
42	11	9179986.3	148396966.6	96	65	4065.1211	13717.8586
43	12	8742167.0	139216980.3	97	66	2961.8308	9652.7375
44	13	8321955.8	130474813.3	98	67	2141.4923	6690.9067
45	14	7918758.8	122152857.5	99	68	1561.0809	4549.4144
46	15	7532418.6	114234098.7	100	69	1182.4462	2988.3335
47	16	7160074.6	106701680.1	101	70	849.04457	1805.88727
48	17	6804062.4	99541605.5	102	71	558.38803	956.84270
49	18	6468794.3	92737543.1	103	72	306.13237	398.45467
50	19	6151318.1	86268748.8	104	73	92.32230	92.32230
51	20	5850707.4	80117430.7	Difference of Age 74 years.			
52	21	5559579.9	74266723.3	74	0	2065851.8	10549370.0
53	22	5278680.1	68707143.4	75	1	1543990.6	8483518.2
54	23	5006908.0	63428463.3	76	2	1246543.1	6939527.6
55	24	4745282.9	58421555.3	77	3	1015141.2	5692984.5
56	25	4492404.6	53676272.4	78	4	846313.41	4677843.31
57	26	4247393.2	49183867.8	79	5	711217.14	3831529.90
58	27	4007761.3	44936474.6	80	6	597903.71	3120312.76
59	28	3767349.7	40928713.3	81	7	503569.25	2522409.05
60	29	3523287.9	37161363.6	82	8	419756.68	2018839.80
61	30	3273621.0	33638075.7	83	9	347891.48	1599083.12
62	31	3033577.0	30364454.7	84	10	285339.12	1251191.64
63	32	2806111.5	27330877.7	85	11	231992.76	965852.52
64	33	2593630.4	24524766.2	86	12	184860.75	733859.76
65	34	2393638.0	21931135.8	87	13	144031.08	548999.01
66	35	2205812.0	19537497.8	88	14	109033.22	404967.93
67	36	2029511.6	17331685.8	89	15	82130.813	295934.710
68	37	1863068.0	15302174.2	90	16	62170.136	213803.897
69	38	1706062.0	13439105.2	91	17	44332.518	151633.761
70	39	1557440.4	11733044.2	92	18	30531.200	107301.243
71	40	1416955.2	10175603.8	93	19	21193.604	76770.043
72	41	1277888.7	8758648.6	94	20	15134.851	55576.439
73	42	1140217.3	7480759.9	95	21	10942.709	40441.588
74	43	1005863.2	6340542.6	96	22	8088.4864	29498.8786
75	44	875554.54	5334679.45	97	23	6102.7632	21410.3922
76	45	757476.45	4459124.91	98	24	4575.8846	15307.6290
77	46	649919.22	3701648.46	99	25	3465.8589	10731.7444
78	47	554856.52	3051729.24	100	26	2732.9728	7265.8855
79	48	473063.52	2496872.72	101	27	2048.5278	4532.9127
80	49	399259.25	2023809.20	102	28	1409.5803	2484.3849
81	50	335789.20	1624549.95	103	29	813.9721	1074.8046
82	51	278596.16	1288760.75	104	30	260.8325	260.8325
83	52	229105.81	1010164.59				
84	53	186000.47	781058.78				

Difference of Age 74 years.

COMMUTATION TABLES FOR JOINT ANNUITIES.

Difference of Age 32 years.

AGES.		D _{x,y}	N _{x,y}	AGES.		D _{x,y}	N _{x,y}
(x)	(y)			(x)	(y)		
32	0	21467271.	284312186.	86	54	119668.45	455533.29
33	1	17455784.	262844915.	87	55	92122.894	335864.843
34	2	15424708.	245389131.	88	56	68844.968	243741.949
35	3	13861086.	229964423.	89	57	51155.764	174896.981
36	4	12813947.	216103337.	90	58	38150.082	123741.217
37	5	11955892.	203289390.	91	59	26724.974	85591.135
38	6	11277263.	191333498.	92	60	18009.255	58866.161
39	7	10693557.	180056235.	93	61	12167.403	40856.906
40	8	10168552.	169362678.	94	62	8437.2445	28689.5027
41	9	9679885.9	159194125.8	95	63	5913.8042	20252.2582
42	10	9221382.5	149514239.9	96	64	4233.4909	14338.4540
43	11	8784511.9	140292857.4	97	65	3088.7371	10104.9631
44	12	8363774.7	131508345.5	98	66	2236.5495	7016.2260
45	13	7960008.9	123144570.8	99	67	1633.5933	4779.6765
46	14	7574265.4	115184561.9	100	68	1240.0466	3146.0832
47	15	7204675.0	107610296.5	101	69	892.8936	1906.0366
48	16	6850013.6	100405621.5	102	70	588.79651	1013.14305
49	17	6513832.9	93555607.9	103	71	325.27458	424.34654
50	18	6194446.5	87041775.0	104	72	99.07196	99.07196
51	19	5892017.8	80847328.5	Difference of Age 73 years.			
52	20	5599113.9	74955310.7	73	0	2308132.1	12235735.6
53	21	5315600.0	69356196.8	74	1	1747917.2	9927603.5
54	22	5042173.8	64040596.8	75	2	1419537.0	8179686.3
55	23	4778943.1	58998423.0	76	3	1165619.6	6760149.3
56	24	4524498.7	54219479.9	77	4	976623.31	5594529.71
57	25	4278688.3	49694981.2	78	5	822005.19	4617906.40
58	26	4037510.0	45416292.9	79	6	698556.07	3795901.21
59	27	3796843.6	41378782.9	80	7	590559.78	3097345.14
60	28	3554204.8	37581939.3	81	8	499139.91	2506785.36
61	29	3306113.5	34027734.5	82	9	416995.13	2007645.45
62	30	3064537.4	30721621.0	83	10	346123.36	1590650.32
63	31	2835045.7	27657083.6	84	11	284058.18	1244526.96
64	32	2620173.4	24822037.9	85	12	230874.46	960468.78
65	33	2417941.1	22201864.5	86	13	183936.45	729594.32
66	34	2228437.8	19783923.4	87	14	143284.69	545657.87
67	35	2050544.8	17555485.6	88	15	108430.82	402373.18
68	36	1882937.0	15504940.8	89	16	81622.384	293942.360
69	37	1724784.7	13622003.8	90	17	61753.087	212319.976
70	38	1575028.4	11897219.1	91	18	44025.990	150566.889
71	39	1433986.6	10322190.7	92	19	30318.628	106540.899
72	40	1294726.5	8888204.1	93	20	21045.011	76222.271
73	41	1156143.4	7593477.6	94	21	15027.987	55177.260
74	42	1020530.8	6437334.2	95	22	10866.706	40149.273
75	43	888510.84	5416803.42	96	23	8031.9141	29282.5673
76	44	768853.83	4528292.58	97	24	6059.7788	21250.6532
77	45	659688.25	3759438.75	98	25	4543.4260	15190.8744
78	46	563201.14	3099750.50	99	26	3440.5090	10647.4484
79	47	480074.19	2536549.36	100	27	2712.8361	7206.9394
80	48	404901.54	2056475.17	101	28	2032.6148	4494.1033
81	49	340447.63	1651573.63	102	29	1397.3188	2461.4885
82	50	282385.27	1311126.00	103	30	805.9724	1064.1697
83	51	232427.73	1028740.73	104	31	258.1973	258.1973
84	52	188871.53	796313.00				
85	53	151908.18	607441.47				

Difference of Age 73 years.

COMMUTATION TABLES FOR JOINT ANNUITIES.

Difference of Age 33 years.

AGES.		$D_{x,y}$	$N_{x,y}$	AGES.		$D_{x,y}$	$N_{x,y}$
(x)	(y)			(x)	(y)		
33	0	20630876.	270780277.	87	54	93706.151	343281.115
34	1	16777022.	250149401.	88	55	70101.389	249574.964
35	2	14823396.	233372379.	89	56	52146.548	179473.575
36	3	13319327.	218548983.	90	57	38964.321	127327.027
37	4	12309450.	205229656.	91	58	27387.930	88362.706
38	5	11481660.	192920206.	92	59	18533.269	60974.776
39	6	10826537.	181438546.	93	60	12588.994	42441.507
40	7	10258787.	170612009.	94	61	8750.3793	29852.5127
41	8	9743991.	160353222.	95	62	6143.6246	21102.1334
42	9	9268488.7	150609231.0	96	63	4401.8607	14958.5088
43	10	8824124.8	141340742.3	97	64	3216.6668	10556.6481
44	11	8404286.7	132516617.5	98	65	2332.3796	7339.9813
45	12	8000009.0	124112330.8	99	66	1706.1057	5007.6017
46	13	7613720.9	116112321.8	100	67	1297.6469	3301.4960
47	14	7244701.0	108498600.9	101	68	936.38902	2003.84910
48	15	6892682.6	101253899.9	102	69	619.20499	1067.46008
49	16	6557824.0	94361217.3	103	70	342.98825	448.25509
50	17	6237575.0	87803393.3	104	71	105.26684	105.26684
51	18	5933328.2	81565818.3	Difference of Age 72 years.			
52	19	5638647.9	75632490.1	72	0	2551185.2	14084027.0
53	20	5353399.1	69993842.2	73	1	1952910.6	11532841.8
54	21	5077439.6	64640443.1	74	2	1607026.1	9579931.2
55	22	4812603.2	59563003.5	75	3	1327383.0	7972905.1
56	23	4556592.7	54750400.3	76	4	1121392.1	6645522.1
57	24	4309255.5	50193807.6	77	5	948572.25	5524129.97
58	25	4067258.6	45884552.1	78	6	807371.87	4575557.72
59	26	3825026.6	41817293.5	79	7	689975.85	3768185.85
60	27	3582029.9	37992266.9	80	8	585365.29	3078210.00
61	28	3335124.7	34410237.0	81	9	495856.10	2492844.71
62	29	3094954.7	31075112.3	82	10	414875.79	1996988.61
63	30	2863979.9	27980157.6	83	11	344569.56	1582112.82
64	31	2647190.4	25116177.7	84	12	282688.91	1237543.26
65	32	2442686.1	22468987.3	85	13	229720.08	954854.35
66	33	2251063.6	20026301.2	86	14	182983.26	725134.27
67	34	2071578.0	17775237.6	87	15	142493.06	542151.01
68	35	1902451.1	15703659.6	88	16	107759.59	399657.95
69	36	1743178.9	13801208.5	89	17	81074.845	291898.365
70	37	1592313.0	12058029.6	90	18	61326.108	210823.520
71	38	1450180.3	10465716.6	91	19	43719.462	149497.412
72	39	1310288.7	9015536.3	92	20	30106.057	105777.950
73	40	1171377.0	7705247.6	93	21	20896.417	75671.893
74	41	1034785.2	6533870.6	94	22	14923.609	54775.476
75	42	901467.16	5499085.44	95	23	10790.702	39851.867
76	43	78031.20	4597618.28	96	24	7975.3419	29061.1646
77	44	669596.83	3817387.08	97	25	6016.7943	21085.8227
78	45	571666.70	3147790.25	98	26	4510.1946	15069.0284
79	46	487294.14	2576123.55	99	27	3415.1592	10558.8338
80	47	410902.07	2088829.41	100	28	2691.7628	7143.6746
81	48	345258.81	1677927.34	101	29	2014.9338	4451.9118
82	49	286302.83	1332668.53	102	30	1383.5860	2436.9780
83	50	235588.92	1046365.70	103	31	797.8298	1053.3920
84	51	191610.08	810776.78	104	32	255.5622	255.5622
85	52	154253.00	619166.70				
86	53	121632.59	464913.70				

Difference of Age 72 years.

COMMUTATION TABLES FOR JOINT ANNUITIES.

Difference of Age 34 years.

AGES.		D _{x,y}	N _{x,y}	AGES.		D _{x,y}	N _{x,y}
(x)	(y)			(x)	(y)		
34	0	19828652.	257748973.	88	54	71306.176	255051.285
35	1	16122992.	237920321.	89	55	53098.223	183745.109
36	2	14244027.	221797329.	90	56	39718.982	130646.886
37	3	12794933.	207553302.	91	57	27972.472	90927.904
38	4	11821194.	194758369.	92	58	18993.016	62955.432
39	5	11022764.	182937175.	93	59	12955.295	43962.416
40	6	10386361.	171914411.	94	60	9053.5734	31007.1215
41	7	9830458.5	161528049.6	95	61	6371.6354	21953.5481
42	8	9329869.5	151697591.1	96	62	4572.9245	15581.9127
43	9	8869201.6	142367721.6	97	63	3344.5967	11008.9882
44	10	8442185.1	133498520.0	98	64	2428.9825	7664.3915
45	11	8038759.0	125056334.9	99	65	1779.2077	5235.4090
46	12	7651980.8	117017575.9	100	66	1355.2473	3456.2013
47	13	7282439.8	109365595.1	101	67	979.88443	2100.95403
48	14	6930975.3	102083155.3	102	68	649.36825	1121.06960
49	15	6598672.9	95152180.0	103	69	360.70192	471.70135
50	16	6279700.4	88553507.1	104	70	110.99943	110.99943
51	17	5974638.6	82273806.7	Difference of Age 71 years.			
52	18	5678181.8	76299168.1	71	0	2792029.9	16089067.7
53	19	5391198.1	70620986.3	72	1	2158557.8	13297037.8
54	20	5113545.1	65229788.2	73	2	1795496.0	11138480.0
55	21	4846263.4	60116243.1	74	3	1502700.6	9342984.0
56	22	4588686.8	55269979.7	75	4	1277017.6	7840283.4
57	23	4339822.8	50681292.9	76	5	1089182.9	6563265.8
58	24	4096315.4	46341470.1	77	6	931685.79	5474082.87
59	25	3853209.6	42245154.7	78	7	797455.08	4542397.08
60	26	3608618.5	38391945.1	79	8	683906.91	3744942.00
61	27	3361234.7	34783326.6	80	9	581514.20	3061035.09
62	28	3122112.9	31422091.9	81	10	493335.96	2479520.89
63	29	2892406.5	28299979.0	82	11	413013.35	1986184.93
64	30	2674207.3	25407572.5	83	12	342908.59	1573171.58
65	31	2467873.0	22733365.2	84	13	281275.46	1230262.99
66	32	2274100.8	20265492.2	85	14	228529.64	948987.53
67	33	2092611.2	17991391.4	86	15	181972.30	720457.89
68	34	1921965.3	15898780.2	87	16	141610.96	538485.59
69	35	1761244.6	13976814.9	88	17	107036.71	396874.63
70	36	1609294.5	12215570.3	89	18	80514.271	289837.924
71	37	1466094.9	10606275.8	90	19	60899.129	209323.653
72	38	1325085.6	9140180.9	91	20	43412.934	148424.524
73	39	1185456.6	7815095.3	92	21	29893.485	105011.590
74	40	1048419.8	6629638.7	93	22	20751.279	75118.105
75	41	914058.5	5581218.9	94	23	14819.231	54366.826
76	42	791608.57	4667160.41	95	24	10714.698	39547.595
77	43	679505.42	3875551.84	96	25	7918.7696	28832.8969
78	44	580253.18	3196046.42	97	26	5972.7865	20914.1273
79	45	494618.72	2615793.24	98	27	4476.9632	14941.3408
80	46	417081.73	2121174.52	99	28	3388.6302	10464.3776
81	47	350375.45	1704092.79	100	29	2668.3480	7075.7474
82	48	290348.83	1353717.34	101	30	1995.1310	4407.3994
83	49	238857.27	1063368.51	102	31	1369.6079	2412.2684
84	50	194216.11	824511.24	103	32	789.6872	1042.6605
85	51	156489.59	630295.13	104	33	252.9733	252.9733
86	52	123510.09	473805.54				
87	53	95244.17	350295.45				

Difference of Age 71 years.

COMMUTATION TABLES FOR JOINT ANNUITIES.

Difference of Age 35 years.

AGES.		$D_{x,y}$	$N_{x,y}$	AGES.		$D_{x,y}$	$N_{x,y}$
(x)	(y)			(x)	(y)		
35	0	19055658.	245196596.	89	54	54010.787	187760.282
36	1	15492828.	226140938.	90	55	40443.853	133749.495
37	2	13683225.	210648110.	91	56	28514.242	93305.642
38	3	12287420.	196964885.	92	57	19398.385	64791.400
39	4	11348728.	184677465.	93	58	13276.672	45393.015
40	5	10574609.	173328737.	94	59	9317.0043	32116.3433
41	6	9952705.6	162754127.8	95	60	6592.4078	22799.3390
42	7	9412662.0	152801422.2	96	61	4742.6413	16206.9312
43	8	8927938.1	143388760.2	97	62	3474.5734	11464.2899
44	9	8485310.8	134460822.1	98	63	2525.5853	7989.7165
45	10	8075009.1	125975511.3	99	64	1852.8992	5464.1312
46	11	7689045.1	117900502.2	100	65	1413.3159	3611.2320
47	12	7319034.9	110211457.1	101	66	1023.3798	2197.9161
48	13	6967079.8	102892422.2	102	67	679.5315	1174.5363
49	14	6635332.2	95925342.4	103	68	378.2728	495.0048
50	15	6318816.8	89290010.2	104	69	116.7320	116.7320
51	16	6014988.3	82971193.4	Difference of Age 70 years.			
52	17	5717715.8	76956205.1				
53	18	5428997.2	71238489.3	70	0	3032399.6	18248702.1
54	19	5149650.6	65809492.1	71	1	2362336.5	15216302.5
55	20	4880725.0	60659841.5	72	2	1984567.0	12853966.0
56	21	4620780.9	55779116.5	73	3	1678935.3	10869399.0
57	22	4370390.1	51158335.6	74	4	1445683.1	9190463.7
58	23	4125372.1	46787945.5	75	5	1240338.5	7744780.6
59	24	3880737.3	42662573.4	76	6	1069793.3	6504442.1
60	25	3635207.0	38781836.1	77	7	920242.08	5434648.83
61	26	3386184.3	35146629.1	78	8	790440.76	4514406.75
62	27	3146555.4	31760444.8	79	9	679407.52	3723965.99
63	28	2917787.4	28613889.4	80	10	578558.72	3044558.47
64	29	2700750.3	25696102.0	81	11	491121.30	2465999.75
65	30	2493059.9	22995351.7	82	12	411022.46	1974878.45
66	31	2297549.4	20502291.8	83	13	341194.05	1563855.99
67	32	2114026.8	18204742.4	84	14	279817.85	1222661.94
68	33	1941479.4	16090715.6	85	15	227267.04	942844.09
69	34	1779310.3	14149236.2	86	16	180845.80	715577.05
70	35	1625972.7	12369925.9	87	17	140661.01	534731.25
71	36	1481730.3	10743953.2	88	18	106296.63	394070.24
72	37	1339627.3	9262222.9	89	19	79953.695	287773.612
73	38	1198843.8	7922595.6	90	20	60472.150	207819.917
74	39	1061021.5	6723751.8	91	21	43106.406	147347.767
75	40	926102.4	5662730.3	92	22	29685.857	104241.361
76	41	802665.45	4736627.88	93	23	20606.141	74555.504
77	42	689414.00	3933962.43	94	24	14714.853	53949.363
78	43	588839.68	3244548.43	95	25	10638.695	39234.510
79	44	502047.94	2655708.75	96	26	7860.8505	28595.8149
80	45	423350.94	2153660.81	97	27	5928.7787	20734.9644
81	46	355644.83	1730309.87	98	28	4442.1862	14806.1857
82	47	294651.72	1374665.04	99	29	3359.1536	10363.9995
83	48	242232.77	1080013.32	100	30	2642.1234	7004.8459
84	49	196910.49	837780.55	101	31	1974.9746	4362.7225
85	50	158617.97	640870.06	102	32	1355.6298	2387.7479
86	51	125300.93	482252.09	103	33	781.6875	1032.1181
87	52	96714.337	356951.158	104	34	250.4306	250.4306
88	53	72476.539	260236.821				

Difference of Age 70 years.

COMMUTATION TABLES FOR JOINT ANNUITIES.

Difference of Age 36 years.

AGES.		D _{x,y}	N _{x,y}	AGES.		D _{x,y}	N _{x,y}
(x)	(y)			(x)	(y)		
36	0	18310871.	233105645.	90	54	41138.935	136667.905
37	1	14882860.	214794774.	91	55	29034.627	95528.970
38	2	13140478.	199911914.	92	56	19774.093	66494.343
39	3	11796320.	186771436.	93	57	13560.036	46720.250
40	4	10887320.	174975116.	94	58	9548.1277	33160.2139
41	5	10133095.	164087796.	95	59	6784.2264	23612.0862
42	6	9529713.7	153954701.4	96	60	4936.9702	16827.8598
43	7	9007164.0	144424987.7	97	61	3603.5266	11920.8896
44	8	8541504.9	135417823.7	98	62	2623.7338	8317.3630
45	9	8116259.1	126876318.8	99	63	1926.5907	5693.6292
46	10	7723718.1	118760059.7	100	64	1471.8529	3767.0385
47	11	7354486.5	111036341.6	101	65	1067.2289	2295.1856
48	12	7002090.2	103681855.1	102	66	709.69475	1227.95669
49	13	6669896.7	96679764.9	103	67	395.84358	518.26194
50	14	6353921.3	90009868.2	104	68	122.41836	122.41836
51	15	6052455.9	83655946.9	Difference of Age 69 years.			
52	16	5756330.4	77603491.0	69	0	3284678.5	20573511.6
53	17	5466796.2	71847160.6	70	1	2565713.3	17288833.1
54	18	5185756.1	66380364.4	71	2	2171920.1	14723119.8
55	19	4915186.6	61194608.3	72	3	1855732.1	12551199.7
56	20	4653639.1	56279421.7	73	4	1615230.8	10695467.6
57	21	4400957.3	51625782.6	74	5	1404159.5	9080236.8
58	22	4154428.9	47224825.3	75	6	1218258.0	7676077.3
59	23	3908264.9	43070396.4	76	7	1056653.2	6457819.3
60	24	3661177.2	39162131.5	77	8	912147.74	5401166.15
61	25	3411133.9	35500954.3	78	9	785240.50	4489018.41
62	26	3169911.5	32089820.4	79	10	675954.51	3703777.91
63	27	2940630.2	28919908.9	80	11	575961.47	3027823.40
64	28	2724449.5	25979278.7	81	12	488753.89	2451861.93
65	29	2517804.9	23254829.2	82	13	408967.35	1963108.04
66	30	2320998.0	20737024.3	83	14	339425.93	1554140.69
67	31	2135824.9	18416026.3	84	15	278271.89	1214714.76
68	32	1961348.3	16280201.4	85	16	225860.15	936442.87
69	33	1797376.1	14318853.1	86	17	179632.65	710582.72
70	34	1642650.9	12521477.0	87	18	139688.43	530950.07
71	35	1497086.4	10878826.1	88	19	105556.55	391261.64
72	36	1353914.0	9381739.7	89	20	79393.119	285705.088
73	37	1212000.2	8027825.7	90	21	60045.171	206311.969
74	38	1073003.4	6815825.5	91	22	42807.006	146266.798
75	39	937233.87	5742822.12	92	23	29478.229	103459.792
76	40	813241.60	4805588.25	93	24	20461.003	73981.563
77	41	699043.47	3992346.65	94	25	14610.474	53520.560
78	42	597426.16	3293303.18	95	26	10560.882	38910.086
79	43	509477.17	2695877.02	96	27	7802.9312	28349.2040
80	44	429709.71	2186399.85	97	28	5882.7239	20546.2728
81	45	360990.57	1756690.14	98	29	4403.5450	14663.5489
82	46	299083.06	1395699.57	99	30	3326.1398	10260.0039
83	47	245822.60	1096616.51	100	31	2615.4306	6933.8641
84	48	199693.21	850793.91	101	32	1954.8181	4318.4335
85	49	160818.49	651100.70	102	33	1341.8969	2363.6154
86	50	127005.11	490282.21	103	34	773.8306	1021.7185
87	51	98116.65	363277.10	104	35	247.8879	247.8879
88	52	73595.27	265160.45				
89	53	54897.278	191565.183				

Difference of Age 69 years.

COMMUTATION TABLES FOR JOINT ANNUITIES.

Difference of Age 37 years.

AGES.		D _{x,y}	N _{x,y}	AGES.		D _{x,y}	N _{x,y}
(x)	(y)			(x)	(y)		
37	0	17589954.	221458561.	91	54	29533.627	97619.846
38	1	14292529.	203868607.	92	55	20134.970	68086.219
39	2	12615284.	189576078.	93	56	13822.667	47951.249
40	3	11316715.	176960794.	94	57	9751.9138	34128.5821
41	4	10432749.	165644079.	95	58	6952.5201	24376.6683
42	5	9702436.1	155211329.9	96	59	5049.7477	17424.1482
43	6	9119173.1	145508893.8	97	60	3728.3860	12374.4005
44	7	8617301.7	136389720.7	98	61	2721.1095	8646.0145
45	8	8170009.1	127772419.0	99	62	2001.4613	5924.9050
46	9	7763173.7	119602409.9	100	63	1530.3898	3923.4437
47	10	7387650.9	111839236.2	101	64	1111.4315	2393.0539
48	11	7036006.6	104451585.3	102	65	740.10324	1281.62236
49	12	6703413.8	97415578.7	103	66	413.41441	541.51912
50	13	6387019.9	90712164.9	104	67	128.10471	128.10471
51	14	6086080.7	84325145.0	Difference of Age 68 years.			
52	15	5792186.8	78239064.3	68	0	3548025.2	23071649.8
53	16	5503716.2	72446877.5	69	1	2779166.5	19523624.6
54	17	5221861.6	66943161.3	70	2	2358903.6	16744458.1
55	18	4949648.2	61721299.7	71	3	2030922.5	14385554.5
56	19	4686497.3	56771651.5	72	4	1785319.4	12354632.0
57	20	4432252.4	52085154.2	73	5	1568837.4	10569312.6
58	21	4183485.7	47652901.8	74	6	1379162.7	9000475.2
59	22	3935792.5	43469416.1	75	7	1203294.4	7621312.5
60	23	3687147.3	39533623.6	76	8	1047359.0	6418018.1
61	24	3435503.3	35846476.3	77	9	906146.78	5370659.12
62	25	3193267.6	32410973.0	78	10	781249.60	4464512.34
63	26	2962457.8	29217705.4	79	11	672920.04	3683262.74
64	27	2745778.6	26255247.6	80	12	573185.11	3010342.70
65	28	2539898.6	23509469.0	81	13	486310.12	2437157.59
66	29	2344035.2	20969570.4	82	14	406848.01	1950847.47
67	30	2157622.9	18625535.2	83	15	337550.65	1543999.46
68	31	1981572.1	16467912.3	84	16	276549.26	1206448.81
69	32	1815770.3	14486340.2	85	17	224345.04	929899.55
70	33	1659329.1	12670569.9	86	18	178390.62	705554.51
71	34	1512442.6	11011240.8	87	19	138715.86	527163.89
72	35	1367945.5	9498798.2	88	20	104816.46	388448.03
73	36	1224925.7	8130852.7	89	21	78832.543	283631.572
74	37	1084778.8	6905927.0	90	22	59628.122	204799.029
75	38	947817.89	5821148.18	91	23	42507.607	145170.907
76	39	823016.52	4873330.29	92	24	29270.601	102663.300
77	40	708254.26	4050313.77	93	25	20315.865	73392.699
78	41	605770.78	3342059.51	94	26	14503.611	53076.834
79	42	516906.39	2736288.73	95	27	10483.068	38573.223
80	43	436068.48	2219382.34	96	28	7742.318	28090.155
81	44	366412.68	1783313.86	97	29	5831.552	20347.837
82	45	303578.62	1416901.18	98	30	4360.267	14516.285
83	46	249519.58	1113322.56	99	31	3292.5365	10156.0179
84	47	202652.61	863802.98	100	32	2588.7377	6863.4814
85	48	163091.16	661150.37	101	33	1935.0154	4274.7437
86	49	128767.07	498059.21	102	34	1328.4093	2339.7283
87	50	99451.109	369292.141	103	35	765.9737	1011.3190
88	51	74662.368	269841.032	104	36	245.3453	245.3453
89	52	55744.660	195178.664				
90	53	41814.158	139434.004				

Difference of Age 68 years.

COMMUTATION TABLES FOR JOINT ANNUITIES.

Difference of Age 38 years.

AGES.		D_{xy}	N_{xy}	AGES.		D_{xy}	N_{xy}
(x)	(y)			(x)	(y)		
38	0	16892246.	210241513.	92	54	20481.017	69581.840
39	1	13721290.	193349267.	93	55	14074.931	49100.823
40	2	12102381.	179627977.	94	56	9940.7888	35025.8921
41	3	10844215.	167525596.	95	57	7100.9080	25085.1033
42	4	9989355.3	156681381.4	96	58	5175.0149	17984.1953
43	5	9284454.5	146692026.1	97	59	3836.8705	12809.1804
44	6	8724462.5	137407571.6	98	60	2815.3939	8972.3099
45	7	8242509.2	128683109.1	99	61	2075.7423	6156.9160
46	8	7814585.4	120440599.9	100	62	1589.8634	4081.1737
47	9	7425989.6	112626014.5	101	63	1155.6342	2491.3103
48	10	7067734.8	105200624.9	102	64	770.75695	1335.67610
49	11	6735883.5	98132890.1	103	65	431.12809	564.91915
50	12	6419115.5	91397006.6	104	66	133.79106	133.79106
51	13	6117784.0	84977891.1	Difference of Age 67 years.			
52	14	5824365.6	78860107.1				
53	15	5537999.1	73035741.5	67	0	3824216.4	25752471.0
54	16	5257127.4	67497742.4	68	1	3001984.1	21928254.6
55	17	4984109.8	62240615.0	69	2	2555151.4	18926270.5
56	18	4719355.5	57256505.2	70	3	2205767.5	16371119.1
57	19	4463547.4	52537149.7	71	4	1953862.5	14165351.6
58	20	4213234.3	48073602.3	72	5	1734040.6	12211489.1
59	21	3963320.1	43860368.0	73	6	1540909.0	10477448.5
60	22	3713117.5	39897047.9	74	7	1362222.7	8936539.5
61	23	3459872.7	36183930.4	75	8	1192710.4	7574316.8
62	24	3216080.5	32724057.7	76	9	1040468.5	6381606.4
63	25	2984285.3	29507977.2	77	10	901541.39	5341137.93
64	26	2766159.9	26523691.9	78	11	777742.44	4439596.54
65	27	2559783.0	23757532.0	79	12	669676.29	3661854.10
66	28	2364604.1	21197749.0	80	13	570319.18	2992177.81
67	29	2179038.5	18833144.9	81	14	483789.99	2421858.63
68	30	2001795.8	16654106.4	82	15	404600.23	1938068.64
69	31	1834492.9	14652310.6	83	16	335461.05	1533468.41
70	32	1676310.5	12817817.7	84	17	274694.11	1198007.36
71	33	1527798.8	11141507.2	85	18	222793.85	923313.25
72	34	1381977.0	9613708.4	86	19	177148.59	700519.40
73	35	1237620.4	8231731.4	87	20	137743.29	523370.81
74	36	1096347.5	6994111.0	88	21	104076.38	385627.52
75	37	958219.44	5897763.54	89	22	78285.005	281551.144
76	38	832310.71	4939544.10	90	23	59211.072	203266.139
77	39	716767.26	4107233.39	91	24	42208.207	144055.067
78	40	613752.58	3390466.13	92	25	29062.973	101846.860
79	41	524126.33	2776713.55	93	26	20167.271	72783.887
80	42	442427.25	2252587.22	94	27	14396.747	52616.616
81	43	371834.80	1810159.97*	95	28	10401.636	38219.869
82	44	308138.40	1438325.17	96	29	7674.9702	27818.2330
83	45	253270.14	1130186.77	97	30	5774.2394	20143.2628
84	46	205700.35	876916.63	98	31	4316.2160	14369.0234
85	47	165508.13	671216.28	99	32	3258.9332	10052.8074
86	48	130586.79	505708.15	100	33	2562.5132	6793.8742
87	49	100830.80	375121.36	101	34	1915.5662	4231.3610
88	50	75677.832	274290.564	102	35	1314.9216	2315.7948
89	51	56552.931	198612.732	103	36	758.1169	1000.8732
90	52	42459.592	142059.801	104	37	242.7563	242.7563
91	53	30018.369	99600.209				

Difference of Age 67 years.

COMMUTATION TABLES FOR JOINT ANNUITIES.

Difference of Age 39 years.

AGES.		$D_{x,y}$	$N_{x,y}$	AGES.		$D_{x,y}$	$N_{x,y}$
(x)	(y)			(x)	(y)		
39	0	16217102.	199440620.	93	54	14316.828	50179.300
40	1	13163421.	183223518.	94	55	10122.208	35862.472
41	2	11597079.	170060097.	95	56	7238.4384	25740.2643
42	3	10383334.	158463018.	96	57	5285.4655	18501.8259
43	4	9559013.2	148079684.5	97	58	3932.0503	13216.3604
44	5	8882590.2	138520671.3	98	59	2897.3132	9284.3101
45	6	8345009.3	129638081.1	99	60	2147.6653	6386.9969
46	7	7883931.5	121293071.8	100	61	1648.8686	4239.3316
47	8	7474564.4	113409140.3	101	62	1200.5441	2590.4630
48	9	7103839.3	105934575.9	102	63	801.41066	1389.91892
49	10	6766258.3	98830736.6	103	64	448.98462	588.50826
50	11	6450208.1	92064478.3	104	65	139.52364	139.52364
51	12	6148526.7	85614270.2	Difference of Age 66 years.			
52	13	5854705.6	79465743.5	66	0	4113785.9	28625107.8
53	14	5568765.7	73611037.9	67	1	3235669.5	24511321.9
54	15	5289874.2	68042272.2	68	2	2760008.8	21275652.4
55	16	5017770.0	62752398.0	69	3	2389275.1	18515643.6
56	17	4752213.7	57734628.0	70	4	2122073.2	16126368.5
57	18	4494842.5	52982414.3	71	5	1897742.7	14004295.3
58	19	4242983.0	48487571.8	72	6	1703171.2	12106552.6
59	20	3991503.1	44244588.8	73	7	1521982.3	10403381.4
60	21	3739087.7	40253085.7	74	8	1350240.7	8881399.1
61	22	3484242.1	36513998.0	75	9	1184863.6	7531158.4
62	23	3238893.4	33029755.9	76	10	1035180.4	6346294.8
63	24	3005605.3	29790862.5	77	11	897494.22	5311114.40
64	25	2786541.1	26785257.2	78	12	773993.41	4413620.18
65	26	2578783.7	23998716.1	79	13	666327.92	3639626.77
66	27	2383116.2	21419932.4	80	14	567363.70	2973298.85
67	28	2198159.6	19036816.2	81	15	481117.11	2405935.15
68	29	2021664.8	16838656.6	82	16	402095.56	1924818.04
69	30	1853215.6	14816991.8	83	17	333210.71	1522722.48
70	31	1693595.2	12963776.2	84	18	272794.80	1189511.77
71	32	1543434.1	11270181.0	85	19	221242.66	916716.97
72	33	1396008.5	9726746.9	86	20	175906.56	695474.31
73	34	1250315.1	8330738.4	87	21	136770.72	519567.75
74	35	1107709.7	7080423.3	88	22	103353.51	382797.03
75	36	968438.5	5972713.6	89	23	77737.466	279443.521
76	37	841444.65	5004275.14	90	24	58794.023	201706.055
77	38	724861.60	4162830.49	91	25	41908.808	142912.032
78	39	621129.71	3437968.89	92	26	28850.402	101003.224
79	40	531032.36	2816839.18	93	27	20018.678	72152.822
80	41	448606.91	2285806.82	94	28	14284.913	52134.144
81	42	377256.91	1837199.91	95	29	10311.156	37849.231
82	43	312698.18	1459943.00	96	30	7599.5404	27538.0747
83	44	257074.29	1147244.82	97	31	5715.9035	19938.5343
84	45	208792.26	890170.53	98	32	4272.1651	14222.6308
85	46	167997.24	681378.27	99	33	3225.9194	9950.4657
86	47	132522.05	513381.03	100	34	2536.7569	6724.5463
87	48	102255.73	380858.98	101	35	1896.1170	4187.7894
88	49	76727.717	278603.247	102	36	1301.4340	2291.6724
89	50	57322.092	201875.530	103	37	750.1172	990.2384
90	51	43075.236	144553.438	104	38	240.1212	240.1212
91	52	30481.725	101478.202				
92	53	20817.177	70996.477				

Difference of Age 66 years.

COMMUTATION TABLES FOR JOINT ANNUITIES.

Difference of Age 40 years.

AGES.		D _{x,y}	N _{x,y}	AGES.		D _{x,y}	N _{x,y}
(x)	(y)			(x)	(y)		
40	0	15557760.	189041532.	94	54	10296.172	36645.659
41	1	12613817.	173483772.	95	55	7370.5399	26349.4873
42	2	11104200.	160869955.	96	56	5387.8344	18978.9474
43	3	9936019.3	149765754.9	97	57	4015.9724	13591.1130
44	4	9145264.9	139829735.6	98	58	2969.1857	9575.1406
45	5	8496259.5	130684470.7	99	59	2210.1556	6605.9549
46	6	7981972.4	122188211.2	100	60	1706.0006	4395.7993
47	7	7540893.1	114206238.8	101	61	1245.1003	2689.7987
48	8	7150884.7	106665345.7	102	62	832.55483	1444.69844
49	9	6800822.8	99514461.0	103	63	466.84115	612.14361
50	10	6479294.7	92713638.2	104	64	145.30246	145.30246
51	11	6178308.6	86234343.5	Difference of Age 65 years.			
52	12	5884126.3	80056034.9	65	0	4418752.0	31700236.3
53	13	5597774.3	74171908.6	66	1	3480674.3	27281484.3
54	14	5319262.4	68574134.3	67	2	2974857.9	23800810.0
55	15	5049025.9	63254871.9	68	3	2580833.5	20825952.1
56	16	4784307.8	58205846.0	69	4	2298618.0	18245118.6
57	17	4526137.5	53421538.2	70	5	2061122.0	15946500.6
58	18	4272731.6	48895400.7	71	6	1863959.2	13885378.6
59	19	4019686.1	44622669.1	72	7	1682251.5	12021419.4
60	20	3765676.2	40602983.0	73	8	1508595.1	10339167.9
61	21	3508611.5	36837306.8	74	9	1341357.6	8830572.8
62	22	3261706.4	33328695.3	75	10	1178841.7	7489215.2
63	23	3026925.2	30066988.9	76	11	1030533.3	6310373.5
64	24	2806448.4	27040063.7	77	12	893167.94	5279840.19
65	25	2597784.3	24233615.3	78	13	770123.44	4386672.25
66	26	2400805.4	21635831.0	79	14	662874.89	3616548.81
67	27	2215368.6	19235025.6	80	15	564229.09	2953673.92
68	28	2039404.9	17019657.0	81	16	478138.77	2389444.83
69	29	1871609.8	14980252.1	82	17	399398.23	1911306.06
70	30	1710879.9	13108642.3	83	18	330906.79	1511907.83
71	31	1559348.7	11397762.4	84	19	270895.48	1181001.04
72	32	1410295.2	9838413.7	85	20	219691.48	910105.56
73	33	1263009.9	8428118.5	86	21	174664.52	690414.08
74	34	1119071.9	7165108.6	87	22	135820.77	515749.56
75	35	978475.08	6046036.73	88	23	102630.64	379928.79
76	36	850418.35	5067561.65	89	24	77189.928	277298.154
77	37	732816.38	4217143.30	90	25	58376.974	200108.226
78	38	628144.03	3484326.92	91	26	41602.280	141731.252
79	39	537415.22	2856182.89	92	27	28637.830	100128.972
80	40	454517.88	2318767.67	93	28	19863.173	71491.142
81	41	382526.29	1864249.79	94	29	14160.654	51627.969
82	42	317257.96	1481723.50	95	30	10209.817	37467.315
83	43	260878.43	1164465.54	96	31	7522.7638	27257.4976
84	44	211928.34	903587.11	97	32	5657.5675	19734.7338
85	45	170522.43	691658.77	98	33	4228.8871	14077.1663
86	46	134515.08	521136.34	99	34	3193.4951	9848.2792
87	47	103771.14	386621.26	100	35	2511.0007	6654.7841
88	48	77812.025	282850.118	101	36	1876.6679	4143.7834
89	49	58117.328	205038.093	102	37	1287.7011	2267.1155
90	50	43661.091	146920.765	103	38	741.9746	979.4144
91	51	30923.696	103259.674	104	39	237.4398	237.4398
92	52	21138.506	72335.978				
93	53	14551.813	51197.472				

Difference of Age 65 years.

COMMUTATION TABLES FOR JOINT ANNUITIES.

Difference of Age 41 years.

AGES.		$D_{x,y}$	$N_{x,y}$	AGES.		$D_{x,y}$	$N_{x,y}$
(x)	(y)			(x)	(y)		
41	0	14908187.	179036310.	95	54	7497.2126	26918.0684
42	1	12077727.	164128123.	96	55	5486.1624	19420.8558
43	2	10625831.	152050396.	97	56	4093.7536	13934.6934
44	3	9505952.8	141424564.8	98	57	3032.5572	9840.9398
45	4	8747509.8	131918612.0	99	58	2264.9821	6808.3826
46	5	8126642.8	123171102.2	100	59	1755.6400	4543.4005
47	6	7634668.2	115044459.4	101	60	1288.2421	2787.7605
48	7	7214341.1	107409791.2	102	61	863.45377	1499.51842
49	8	6845861.4	100195450.1	103	62	484.98338	636.06465
50	9	6512393.3	93349588.7	104	63	151.08127	151.08127
51	10	6206169.1	86837195.4	Difference of Age 64 years.			
52	11	5912627.5	80631026.3	64	0	4739821.6	34988576.3
53	12	5625903.8	74718398.8	65	1	3738706.1	30248754.7
54	13	5346971.3	69092495.0	66	2	3200114.0	26510048.6
55	14	5077076.0	63745523.7	67	3	2781735.0	23309934.6
56	15	4814109.4	58668447.7	68	4	2482908.0	20528199.6
57	16	4556704.8	53854338.3	69	5	2232596.0	18045291.6
58	17	4302480.2	49297633.5	70	6	2024430.0	15812695.6
59	18	4047869.2	44995153.3	71	7	1841064.5	13788265.6
60	19	3792264.7	40947284.1	72	8	1667454.6	11947201.1
61	20	3533561.1	37155019.4	73	9	1498670.2	10279746.5
62	21	3284519.3	33621458.3	74	10	1334540.3	8781076.3
63	22	3048245.2	30336939.0	75	11	1173549.6	7446536.0
64	23	2826355.6	27288693.8	76	12	1025565.8	6272986.4
65	24	2616343.1	24462338.2	77	13	888702.1	5247420.6
66	25	2418494.7	21845995.1	78	14	766132.53	4358718.52
67	26	2231812.7	19427500.4	79	15	659212.60	3592585.99
68	27	2055371.0	17195687.7	80	16	560736.24	2933373.39
69	28	1888033.2	15140316.7	81	17	474931.92	2372637.15
70	29	1727861.3	13252283.5	82	18	396636.67	1897705.83
71	30	1575263.3	11524422.2	83	19	328602.88	1501069.16
72	31	1424836.9	9949158.9	84	20	268996.16	1172466.28
73	32	1275935.4	8524322.0	85	21	218140.29	903470.12
74	33	1130434.1	7248386.6	86	22	173451.37	685329.83
75	34	988511.65	6117952.53	87	23	134870.81	511878.46
76	35	859231.81	5129440.88	88	24	101907.76	377007.65
77	36	740631.60	4270209.07	89	25	76642.39	275099.89
78	37	635037.40	3529577.47	90	26	57949.995	198457.497
79	38	543484.16	2894540.07	91	27	41295.752	140507.502
80	39	459981.05	2351055.91	92	28	28415.372	99211.750
81	40	387566.56	1891074.86	93	29	19690.389	70796.378
82	41	321689.29	1503508.30	94	30	14021.483	51105.989
83	42	264682.57	1181819.01	95	31	10106.670	37084.506
84	43	215064.42	917136.44	96	32	7445.9872	26977.8363
85	44	173083.69	702072.02	97	33	5600.2550	19531.8491
86	45	136536.99	528988.33	98	34	4186.3818	13931.5941
87	46	105331.77	392451.34	99	35	3161.0708	9745.2123
88	47	78965.178	287119.568	100	36	2485.2444	6584.1415
89	48	58938.636	208154.390	101	37	1856.8651	4098.8971
90	49	44266.805	149215.754	102	38	1273.7231	2242.0320
91	50	31344.281	104948.949	103	39	733.6891	968.3089
92	51	21445.004	73604.668	104	40	234.6198	234.6198
93	52	14776.431	52159.664				
94	53	10465.165	37383.233				

Difference of Age 64 years.

COMMUTATION TABLES FOR JOINT ANNUITIES.

Difference of Age 42 years.

AGES.		D _{x,y}	N _{x,y}	AGES.		D _{x,y}	N _{x,y}
(x)	(y)			(x)	(y)		
42	0	14274586.	169424322.	96	54	5580.4495	19831.7542
43	1	11557418.	155149736.	97	55	4168.4646	14251.3047
44	2	10165907.	143592318.	98	56	3091.2917	10082.8401
45	3	9092510.2	133426410.9	99	57	2313.3238	6991.5484
46	4	8366962.8	124333900.7	100	58	1799.1915	4678.2246
47	5	7773043.7	115966937.9	101	59	1325.7260	2879.0331
48	6	7304055.5	108193894.2	102	60	893.3718	1553.3071
49	7	6906611.0	100889838.7	103	61	502.9828	659.9353
50	8	6555521.7	93983227.7	104	62	156.9525	156.9525
51	9	6237872.4	87427706.0	Difference of Age 63 years.			
52	10	5939289.9	81189833.6	63	0	5076178.5	38499557.6
53	11	5653154.3	75250543.7	64	1	4010363.0	33423379.1
54	12	5373840.5	69597389.4	65	2	3437347.2	29413016.1
55	13	5103523.3	64223548.9	66	3	2992367.9	25975668.9
56	14	4840854.4	59120025.6	67	4	2676186.6	22983301.0
57	15	4585088.6	54279171.2	68	5	2411592.7	20307114.4
58	16	4331537.0	49694082.6	69	6	2192851.4	17895521.7
59	17	4076052.2	45362545.6	70	7	1999564.3	15702670.3
60	18	3818853.3	41286493.4	71	8	1824870.7	13703106.0
61	19	3558510.7	37467640.1	72	9	1656484.6	11878235.3
62	20	3307875.4	33909129.4	73	10	1491053.3	10221750.7
63	21	3069565.1	30601254.0	74	11	1328549.3	8730697.4
64	22	2846262.9	27531688.9	75	12	1167892.7	7402148.1
65	23	2634901.8	24685426.0	76	13	1020437.9	6234255.4
66	24	2435772.6	22050524.2	77	14	884096.7	5213817.5
67	25	2248256.8	19614751.6	78	15	761899.76	4329720.85
68	26	2070627.5	17366494.8	79	16	655131.76	3567821.09
69	27	1902814.2	15295867.3	80	17	556974.72	2912689.33
70	28	1743023.3	13393053.1	81	18	471647.51	2355714.61
71	29	1590898.6	11650029.8	82	19	393875.11	1884067.10
72	30	1439378.7	10059131.2	83	20	326298.96	1490191.99
73	31	1289091.8	8619752.5	84	21	267096.85	1163893.03
74	32	1142002.9	7330660.7	85	22	216625.17	896796.18
75	33	998548.24	6188657.84	86	23	172238.23	680171.01
76	34	868045.27	5190109.60	87	24	133920.86	507932.78
77	35	748307.26	4322064.33	88	25	101184.89	374011.92
78	36	641809.85	3573757.07	89	26	76081.814	272827.031
79	37	549448.47	2931947.22	90	27	57523.016	196745.217
80	38	465175.54	2382498.75	91	28	40974.966	139222.201
81	39	392225.00	1917323.21	92	29	28168.196	98247.235
82	40	325927.96	1525098.21	93	30	19496.872	70079.039
83	41	268379.55	1199170.25	94	31	13879.826	50582.167
84	42	218200.50	930790.70	95	32	10003.522	36702.341
85	43	175644.96	712590.20	96	33	7370.5574	26698.8186
86	44	138587.79	536945.24	97	34	5543.9659	19328.2612
87	45	106915.03	398357.45	98	35	4143.8766	13784.2952
88	46	80152.754	291442.423	99	36	3128.6466	9640.4187
89	47	59812.090	211289.669	100	37	2459.0199	6511.7721
90	48	44892.379	151477.579	101	38	1836.7087	4052.7522
91	49	31779.123	106585.200	102	39	1259.4997	2216.0435
92	50	21736.672	74806.077	103	40	724.9752	956.5438
93	51	14990.682	53069.405	104	41	231.5686	231.5686
94	52	10626.703	38078.723				
95	53	7620.266	27452.020				

Difference of Age 63 years.

COMMUTATION TABLES FOR JOINT ANNUITIES.

Difference of Age 43 years.

AGES.		D_{xy}	N_{xy}	AGES.		D_{xy}	N_{xy}
(x)	(y)			(x)	(y)		
43	0	13659636.	160199370.5	97	54	4240.1052	14544.7002
44	1	11057171.	146539734.5	98	55	3147.7078	10304.5950
45	2	9723760.9	135482563.5	99	56	2358.1282	7156.8872
46	3	8696954.4	125758802.6	100	57	1837.5917	4798.7590
47	4	8002907.2	117061848.2	101	58	1358.6128	2961.1673
48	5	7436438.6	109058941.0	102	59	919.36615	1602.55449
49	6	6992498.5	101622502.4	103	60	520.41075	683.18834
50	7	6613694.9	94630003.9	104	61	162.77759	162.77759
51	8	6279182.8	88016309.0	Difference of Age 62 years.			
52	9	5969630.0	81737126.2				
53	10	5678646.7	75767496.2	62	0	5431650.9	42246240.2
54	11	5399870.0	70088849.5	63	1	4294954.6	36814589.3
55	12	5129169.1	64688979.5	64	2	3687107.2	32519634.7
56	13	4866071.2	59559810.4	65	3	3214200.2	28832527.5
57	14	4610561.4	54693739.2	66	4	2878827.4	25618327.3
58	15	4358518.3	50083177.8	67	5	2599319.9	22739499.9
59	16	4103579.8	45724659.5	68	6	2368661.6	20140180.0
60	17	3845441.8	41621079.7	69	7	2165917.0	17771518.4
61	18	3583460.3	37775637.9	70	8	1981976.4	15605601.4
62	19	3331231.5	34192177.6	71	9	1812865.0	13623625.0
63	20	3091392.7	30860946.1	72	10	1648065.6	11810760.0
64	21	2866170.1	27769553.4	73	11	1484359.7	10162694.4
65	22	2653460.6	24903383.3	74	12	1322145.1	8678334.7
66	23	2453050.5	22249922.7	75	13	1162053.2	7356189.6
67	24	2264318.5	19796872.2	76	14	1015149.8	6194136.4
68	25	2085884.0	17532553.7	77	15	879212.19	5178986.61
69	26	1916938.4	15446669.7	78	16	757183.24	4299774.42
70	27	1756669.1	13529731.3	79	17	650737.00	3542591.18
71	28	1604858.8	11773062.2	80	18	553123.63	2891854.18
72	29	1453665.3	10168203.4	81	19	468363.69	2338730.55
73	30	1302248.1	8714538.1	82	20	391113.56	1870366.86
74	31	1153778.2	7412290.0	83	21	323995.04	1479253.30
75	32	1008767.3	6258511.8	84	22	265241.70	1155258.26
76	33	876858.73	5249744.48	85	23	215110.06	890016.56
77	34	755982.92	4372885.75	86	24	171025.08	674906.50
78	35	648461.35	3616902.83	87	25	132970.90	503881.42
79	36	555308.14	2968441.48	88	26	100444.81	370910.52
80	37	470280.47	2413133.34	89	27	75521.238	270465.711
81	38	396654.33	1942852.87	90	28	57076.177	194944.473
82	39	329845.52	1546198.54	91	29	40618.538	137868.296
83	40	271915.80	1216353.02	92	30	27891.358	97249.758
84	41	221248.24	944437.22	93	31	19299.899	69358.400
85	42	178206.22	723188.98	94	32	13738.170	50058.501
86	43	140638.59	544982.76	95	33	9902.1837	36320.3311
87	44	108520.90	404344.17	96	34	7296.4747	26418.1474
88	45	81357.541	295823.266	97	35	5487.6767	19121.6727
89	46	60711.618	214465.725	98	36	4101.3713	13633.9960
90	47	45557.672	153754.107	99	37	3095.6328	9532.6247
91	48	32228.222	108196.435	100	38	2432.3270	6436.9919
92	49	22038.227	75968.213	101	39	1816.1986	4004.6649
93	50	15194.567	53929.986	102	40	1244.5407	2188.4663
94	51	10780.785	38735.419	103	41	715.5469	943.9256
95	52	7737.8907	27954.6336	104	42	228.3787	228.3787
96	53	5672.0427	20216.7429				

Difference of Age 62 years.

COMMUTATION TABLES FOR JOINT ANNUITIES.

Difference of Age 44 years.

AGES.		$D_{x,y}$	$N_{x,y}$	AGES.		$D_{x,y}$	$N_{x,y}$
(x)	(y)			(x)	(y)		
44	0	13068398.	151353269.1	98	54	3201.8054	10509.9046
45	1	10576262.	138284871.1	99	55	2401.1640	7308.0992
46	2	9300743.5	127708609.1	100	56	1873.1822	4906.9352
47	3	8318540.5	118407865.6	101	57	1387.6097	3033.7530
48	4	7656348.0	110089325.1	102	58	942.17251	1646.14330
49	5	7119235.0	102432977.1	103	59	535.55308	703.97079
50	6	6695939.9	95313742.1	104	60	168.41771	168.41771
51	7	6334903.9	88617802.2	Difference of Age 61 years.			
52	8	6009163.9	82282898.3	61	0	5802235.0	46236928.0
53	9	5707655.2	76273734.4	62	1	4595719.8	40434693.0
54	10	5424220.3	70566079.2	63	2	3948759.2	35838973.2
55	11	5154013.6	65141858.9	64	3	3447746.2	31890214.0
56	12	4890523.8	59987845.3	65	4	3092242.6	28442467.8
57	13	4634578.5	55097321.5	66	5	2796140.3	25350225.2
58	14	4382732.3	50462743.0	67	6	2553046.9	22554084.9
59	15	4129141.1	46080010.7	68	7	2339567.8	20001038.0
60	16	3871412.0	41950869.6	69	8	2146865.9	17661470.2
61	17	3608409.9	38079457.6	70	9	1968937.1	15514604.3
62	18	3354587.6	34471047.7	71	10	1803651.3	13545667.2
63	19	3113220.3	31116460.1	72	11	1640667.2	11742015.9
64	20	2886551.3	28003239.8	73	12	1477204.5	10101348.7
65	21	2672019.3	25116688.5	74	13	1315534.4	8624144.2
66	22	2470328.4	22444669.2	75	14	1156031.3	7308609.8
67	23	2280380.2	19974340.8	76	15	1009541.3	6152578.5
68	24	2100785.7	17693960.6	77	16	873769.45	5143037.19
69	25	1931062.5	15593174.9	78	17	752103.90	4269267.74
70	26	1769708.4	13662112.4	79	18	646237.61	3517163.84
71	27	1617422.9	11892404.0	80	19	549272.54	2870926.23
72	28	1466421.2	10274981.1	81	20	465079.88	2321653.69
73	29	1315173.7	8808559.9	82	21	388352.00	1856573.81
74	30	1165553.6	7493386.2	83	22	321744.70	1468221.81
75	31	1019168.8	6327832.6	84	23	263386.56	1146477.11
76	32	885832.42	5308663.82	85	24	213594.95	883090.55
77	33	763658.58	4422831.40	86	25	169811.93	669495.60
78	34	655112.86	3659172.82	87	26	131998.33	499683.67
79	35	561063.17	3004059.96	88	27	99704.725	367685.339
80	36	475295.84	2442996.79	89	28	74934.589	267980.614
81	37	401007.30	1967700.95	90	29	56579.690	193046.025
82	38	333570.41	1566693.65	91	30	40219.339	136466.335
83	39	275184.15	1233123.24	92	31	27609.578	96246.996
84	40	224163.47	957939.09	93	32	19102.926	68637.418
85	41	180695.34	733775.62	94	33	13598.999	49534.492
86	42	142689.39	553080.28	95	34	9802.6552	35935.4931
87	43	110126.78	410390.89	96	35	7222.3920	26132.8379
88	44	82579.539	300264.111	97	36	5431.3876	18910.4459
89	45	61624.183	217684.572	98	37	4058.0932	13479.0583
90	46	46242.825	156060.389	99	38	3062.0295	9420.9651
91	47	32705.836	109817.564	100	39	2405.1659	6358.9356
92	48	22349.669	77111.728	101	40	1794.6277	3953.7697
93	49	15405.362	54762.059	102	41	1228.3556	2159.1420
94	50	10927.412	39356.697	103	42	705.6901	930.7864
95	51	7850.0865	28429.2852	104	43	225.0963	225.0963
96	52	5759.5950	20579.1987				
97	53	4309.6991	14819.6037				

Difference of Age 61 years.

COMMUTATION TABLES FOR JOINT ANNUITIES.

Difference of Age 45 years.

AGES.		$D_{x,y}$	$N_{x,y}$	AGES.		$D_{x,y}$	$N_{x,y}$
(x)	(y)			(x)	(y)		
45	0	12500014.	142872619.4	99	54	2442.4313	7448.7217
46	1	10116158.	130372605.4	100	55	1907.3677	5006.2904
47	2	8896058.1	120256447.9	101	56	1414.4849	3098.9227
48	3	7958313.2	111360389.8	102	57	962.28134	1684.43782
49	4	7329764.1	103402076.6	103	58	548.83834	722.15648
50	5	6817301.3	96072312.5	104	59	173.31814	173.31814
51	6	6413681.9	89255011.2	Difference of Age 60 years.			
52	7	6062488.8	82841329.3				
53	8	5745454.2	76778840.5	60	0	6183376.4	50475607.5
54	9	5451929.1	71033386.3	61	1	4909271.0	44292231.1
55	10	5177255.1	65581457.2	62	2	4225281.2	39382960.1
56	11	4914212.3	60404202.1	63	3	3692412.2	35157678.9
57	12	4657867.8	55489989.8	64	4	3316927.1	31465266.7
58	13	4405562.6	50832122.0	65	5	3003425.7	28148339.6
59	14	4152080.8	46426559.4	66	6	2746363.5	25144913.9
60	15	3895527.1	42274478.6	67	7	2521688.3	22398550.4
61	16	3632779.3	38378951.5	68	8	2318989.3	19876862.1
62	17	3377943.7	34746172.2	69	9	2132741.7	17557872.8
63	18	3135047.8	31368228.5	70	10	1958930.1	15425131.1
64	19	2906932.6	28233180.7	71	11	1795554.4	13466201.0
65	20	2691020.0	25326248.1	72	12	1632758.5	11670646.6
66	21	2487606.3	22635228.1	73	13	1469818.5	10037888.1
67	22	2296441.9	20147621.8	74	14	1308717.1	8568069.6
68	23	2115687.4	17851179.9	75	15	1149644.3	7259352.5
69	24	1944858.1	15735492.5	76	16	1003291.7	6109708.2
70	25	1782747.7	13790634.4	77	17	867908.03	5106416.54
71	26	1629428.6	12007886.7	78	18	746903.64	4238508.51
72	27	1477901.6	10378458.1	79	19	641738.23	3491604.87
73	28	1326714.3	8900556.5	80	20	545421.45	2849866.64
74	29	1177122.4	7573842.2	81	21	461796.06	2304445.19
75	30	1029570.4	6396719.8	82	22	385654.66	1842649.13
76	31	894966.36	5367149.41	83	23	319494.37	1456994.47
77	32	771473.80	4472183.05	84	24	261531.41	1137500.10
78	33	661764.36	3700709.25	85	25	212079.83	875968.69
79	34	566818.20	3038944.89	86	26	168569.90	663888.86
80	35	480221.65	2472126.69	87	27	131025.76	495318.96
81	36	405283.89	1991905.04	88	28	98930.219	364293.205
82	37	337231.08	1586621.15	89	29	74282.757	265362.986
83	38	278291.76	1249390.07	90	30	56023.624	191080.229
84	39	226857.85	971098.31	91	31	39813.011	135056.605
85	40	183076.23	744240.46	92	32	27327.797	95243.594
86	41	144682.42	561164.23	93	33	18909.409	67915.797
87	42	111732.65	416481.81	94	34	13462.313	49006.388
88	43	83801.538	304749.162	95	35	9703.1267	35544.0747
89	44	62549.784	220947.624	96	36	7148.3093	25840.9480
90	45	46937.907	158397.840	97	37	5374.0750	18692.6387
91	46	33197.707	111459.933	98	38	4014.0423	13318.5637
92	47	22680.885	78262.226	99	39	3027.8366	9304.5214
93	48	15623.070	55581.341	100	40	2376.5999	6276.6848
94	49	11079.009	39958.271	101	41	1771.2887	3900.0849
95	50	7956.8535	28879.2617	102	42	1211.4347	2128.7962
96	51	5843.1065	20922.4082	103	43	695.5476	917.3615
97	52	4376.2226	15079.3017	104	44	221.8139	221.8139
98	53	3254.3574	10703.0791				

Difference of Age 60 years.

COMMUTATION TABLES FOR JOINT ANNUITIES.

Difference of Age 46 years.

AGES.		D _{x,y}	N _{x,y}	AGES.		D _{x,y}	N _{x,y}
(x)	(y)			(x)	(y)		
46	0	11956220.	134744986.8	100	54	1940.1484	5099.5363
47	1	9675992.9	122788766.8	101	55	1440.2993	3159.3879
48	2	8510821.9	113112773.9	102	56	980.9188	1719.0886
49	3	7618848.7	104601952.0	103	57	560.5522	738.1698
50	4	7018901.6	96983103.3	104	58	177.6176	177.6176
51	5	6529927.4	89964201.7	Difference of Age 59 years.			
52	6	6137879.2	83434274.3	59	0	6554192.3	54946071.2
53	7	5796439.0	77296395.1	60	1	5231754.8	48391878.9
54	8	5488034.6	71499956.1	61	2	4513558.6	43160124.1
55	9	5203702.4	66011921.5	62	3	3950982.9	38646565.5
56	10	4936372.5	60808219.1	63	4	3552309.7	34695582.6
57	11	4680429.4	55871846.6	64	5	3221656.7	31143272.9
58	12	4427701.1	51191417.2	65	6	2949958.8	27921616.2
59	13	4173709.6	46763716.1	66	7	2712630.4	24971657.4
60	14	3917168.9	42590006.5	67	8	2499507.8	22259027.0
61	15	3655408.0	38672837.6	68	9	2303732.8	19759519.2
62	16	3400756.6	35017429.6	69	10	2121902.3	17455786.4
63	17	3156875.4	31616673.0	70	11	1950136.2	15333884.1
64	18	2927313.8	28459797.6	71	12	1786899.1	13383747.9
65	19	2710020.6	25532483.8	72	13	1624594.7	11596848.8
66	20	2505295.6	22822463.2	73	14	1462201.7	9972254.1
67	21	2312503.7	20317167.6	74	15	1301486.6	8510052.4
68	22	2130589.1	18004663.9	75	16	1142527.5	7208565.8
69	23	1958653.8	15874074.8	76	17	996561.48	6066038.26
70	24	1795483.8	13915421.0	77	18	861907.05	5069476.78
71	25	1641434.4	12119937.2	78	19	741703.37	4207569.73
72	26	1488871.7	10478502.8	79	20	637238.84	3465866.36
73	27	1337100.9	8989631.1	80	21	541570.37	2828627.52
74	28	1187451.6	7652530.2	81	22	458588.61	2287057.15
75	29	1039789.4	6465078.6	82	23	382957.33	1828468.54
76	30	904100.32	5425289.23	83	24	317244.03	1445511.21
77	31	779428.58	4521188.91	84	25	259676.26	1128267.18
78	32	668536.80	3741760.33	85	26	210528.65	868590.92
79	33	572573.22	3073223.53	86	27	167327.86	658062.27
80	34	485147.46	2500650.31	87	28	130007.95	490734.41
81	35	409484.12	2015502.85	88	29	98069.657	360726.458
82	36	340827.53	1606018.73	89	30	73552.705	262656.801
83	37	281345.79	1265191.20	90	31	55457.628	189104.096
84	38	229419.72	983845.41	91	32	39406.683	133646.468
85	39	185276.75	754425.69	92	33	27050.959	94239.785
86	40	146588.80	569148.94	93	34	18719.347	67188.826
87	41	113293.29	422560.14	94	35	13325.627	48469.479
88	42	85023.536	309266.849	95	36	9603.5982	35143.8520
89	43	63475.386	224243.313	96	37	7072.8796	25540.2538
90	44	47642.919	160767.927	97	38	5315.7391	18467.3742
91	45	33696.706	113125.008	98	39	3969.2186	13151.6351
92	46	23021.988	79428.302	99	40	2991.8751	9182.4165
93	47	15854.599	56406.314	100	41	2345.6924	6190.5414
94	48	11235.576	40551.715	101	42	1746.8889	3844.8490
95	49	8067.2396	29316.1391	102	43	1194.0234	2097.9601
96	50	5922.5770	21248.8995	103	44	685.4051	903.9367
97	51	4439.6758	15326.3225	104	45	218.5316	218.5316
98	52	3304.5909	10886.6467				
99	53	2482.5195	7582.0558				

Difference of Age 59 years.

COMMUTATION TABLES FOR JOINT ANNUITIES.

Difference of Age 47 years.

AGES.		D _{x,y}	N _{x,y}	AGES.		D _{x,y}	N _{x,y}
(x)	(y)			(x)	(y)		
47	0	11435992.	126955947.2	101	54	1465.0527	3216.6907
48	1	9256982.1	115519955.2	102	55	998.82057	1751.63805
49	2	8147790.0	106262973.1	103	56	571.40900	752.81748
50	3	7295726.0	98115183.1	104	57	181.40848	181.40848
51	4	6723029.6	90819457.1	Difference of Age 58 years.			
52	5	6249126.0	84096427.5	58	0	6918283.0	59639251.4
53	6	5868520.9	77847301.5	59	1	5545502.1	52720968.4
54	7	5536735.0	71978780.6	60	2	4810048.5	47175466.3
55	8	5238164.0	66412045.6	61	3	4220545.7	42365417.8
56	9	4961589.3	61203881.6	62	4	3801069.3	38144872.1
57	10	4701535.3	56242292.3	63	5	3450278.5	34343802.8
58	11	4449147.8	51540757.0	64	6	3164304.9	30893524.3
59	12	4194683.1	47091609.2	65	7	2913725.1	27729219.4
60	13	3937574.1	42896926.1	66	8	2688770.5	24815494.3
61	14	3675715.9	38959352.0	67	9	2483063.7	22126723.8
62	15	3421940.1	35283636.1	68	10	2292024.3	19643660.1
63	16	3178195.4	31861696.0	69	11	2112376.7	17351635.8
64	17	2947695.0	28683500.6	70	12	1940735.7	15239259.1
65	18	2729021.2	25735805.6	71	13	1777964.6	13298523.4
66	19	2522984.9	23006784.4	72	14	1616175.8	11520558.8
67	20	2328947.8	20483799.5	73	15	1454123.2	9904383.0
68	21	2145490.8	18154851.7	74	16	1293429.8	8450259.8
69	22	1972449.4	16009360.9	75	17	1134863.2	7156830.0
70	23	1808219.9	14036911.5	76	18	989670.96	6021966.80
71	24	1653160.9	12228691.6	77	19	855906.08	5032295.84
72	25	1499841.8	10575530.7	78	20	736503.10	4176389.76
73	26	1347025.9	9075688.9	79	21	632739.46	3439886.66
74	27	1196748.0	7728663.0	80	22	537808.84	2807147.20
75	28	1048913.6	6531915.0	81	23	455381.17	2269338.36
76	29	913074.02	5483001.44	82	24	380260.00	1813957.19
77	30	787383.35	4569927.42	83	25	314993.69	1433697.19
78	31	675430.18	3782544.07	84	26	257776.95	1118703.50
79	32	578432.90	3107113.89	85	27	208977.46	860926.55
80	33	490073.27	2528680.99	86	28	166028.06	651949.09
81	34	413684.35	2038607.72	87	29	128877.06	485921.03
82	35	344359.75	1624923.37	88	30	97105.827	357043.970
83	36	284346.24	1280563.62	89	31	72809.617	259938.143
84	37	231937.41	996217.38	90	32	54891.633	187128.526
85	38	187369.05	764279.97	91	33	39007.483	132236.893
86	39	148350.75	576910.92	92	34	26779.066	93229.410
87	40	114786.08	428560.17	93	35	18529.285	66450.344
88	41	86211.111	313774.095	94	36	13188.942	47921.059
89	42	64400.986	227562.984	95	37	9502.260	34732.117
90	43	48347.931	163161.998	96	38	6996.103	25229.857
91	44	34202.834	114814.067	97	39	5256.3796	18233.7539
92	45	23368.035	80611.233	98	40	3922.0764	12977.3743
93	46	16093.040	57243.198	99	41	2952.9660	9055.2979
94	47	11402.085	41150.158	100	42	2313.3800	6102.3319
95	48	8181.245	29748.073	101	43	1721.7818	3788.9519
96	49	6004.7414	21566.8282	102	44	1176.6121	2067.1701
97	50	4500.0587	15562.0868	103	45	675.2626	890.5580
98	51	3352.5059	11062.0281	104	46	215.2954	215.2954
99	52	2520.8390	7709.5222				
100	53	1971.9925	5188.6832				

Difference of Age 58 years.

COMMUTATION TABLES FOR JOINT ANNUITIES.

Difference of Age 48 years.

AGES.		D _{x,y}	N _{x,y}	AGES.		D _{x,y}	N _{x,y}
(x)	(y)			(x)	(y)		
48	0	10940766.	119491934.7	102	54	1015.9866	1782.7458
49	1	8862122.5	108551168.7	103	55	581.8372	766.7592
50	2	7802234.4	99689046.2	104	56	184.9220	184.9220
51	3	6988184.8	91886811.8	Difference of Age 57 years.			
52	4	6433924.3	84898627.0	57	0	7277918.5	64549414.3
53	5	5974885.6	78464702.7	58	1	5853559.2	57271495.8
54	6	5605587.4	72489817.1	59	2	5098506.2	51417936.6
55	7	5284647.1	66884229.7	60	3	4497788.0	46319430.4
56	8	4994447.5	61599582.6	61	4	4060404.0	41821642.4
57	9	4725552.5	56605135.1	62	5	3691893.1	37761238.4
58	10	4469210.8	51879582.6	63	6	3388856.8	34069345.3
59	11	4215001.1	47410371.8	64	7	3125438.4	30680488.5
60	12	3957360.9	43195370.7	65	8	2888096.3	27555050.1
61	13	3694863.2	39238009.8	66	9	2671081.2	24666953.8
62	14	3440950.8	35543146.6	67	10	2470443.8	21995872.6
63	15	3197992.4	32102195.8	68	11	2281735.0	19525428.8
64	16	2967602.3	28904203.4	69	12	2102194.2	17243633.8
65	17	2748021.9	25936601.1	70	13	1931032.1	15141499.6
66	18	2540674.2	23188579.2	71	14	1768750.9	13210407.5
67	19	2345391.9	20647905.0	72	15	1607246.7	11441716.6
68	20	2160747.3	18302513.1	73	16	1445121.5	9834469.9
69	21	1986245.1	16141765.8	74	17	1284753.2	8389348.4
70	22	1820956.0	14155520.7	75	18	1127016.4	7104595.2
71	23	1664887.4	12334564.7	76	19	982780.43	5977578.81
72	24	1510556.8	10669677.3	77	20	849905.11	4994798.38
73	25	1356950.9	9159120.5	78	21	731302.84	4144893.27
74	26	1205631.1	7802169.6	79	22	628344.70	3413590.43
75	27	1057125.3	6596538.5	80	23	534047.31	2785245.73
76	28	921086.25	5539413.25	81	24	452173.72	2251198.42
77	29	795198.57	4618327.00	82	25	377562.66	1799024.70
78	30	682323.56	3823128.43	83	26	312689.77	1421462.04
79	31	584397.19	3140804.87	84	27	255877.63	1108772.27
80	32	495088.63	2556407.68	85	28	207354.12	852894.64
81	33	417884.58	2061319.05	86	29	164583.83	645540.52
82	34	347891.98	1643434.47	87	30	127610.45	480956.69
83	35	287293.11	1295542.49	88	31	96124.786	353346.236
84	36	234410.94	1008249.38	89	32	72066.529	257221.450
85	37	189425.28	773838.44	90	33	54335.567	185154.921
86	38	150026.05	584413.16	91	34	38615.413	130819.354
87	39	116165.77	434387.11	92	35	26507.172	92203.941
88	40	87347.053	318221.343	93	36	18339.224	65696.769
89	41	65300.515	230874.290	94	37	13049.770	47357.545
90	42	49052.943	165573.775	95	38	9399.1123	34307.7750
91	43	34708.961	116520.832	96	39	6917.9795	24908.6627
92	44	23719.025	81811.871	97	40	5193.9499	17990.6832
93	45	16334.937	58092.846	98	41	3871.0701	12796.7333
94	46	11573.563	41757.909	99	42	2912.2883	8925.6632
95	47	8302.4889	30184.3461	100	43	2280.1310	6013.3749
96	48	6089.5999	21881.8572	101	44	1696.6747	3733.2439
97	49	4562.4884	15792.2573	102	45	1159.2008	2036.5692
98	50	3398.1024	11229.7689	103	46	665.2629	877.3684
99	51	2557.3900	7831.6665	104	47	212.1055	212.1055
100	52	2002.4317	5274.2765				
101	53	1489.0990	3271.8448				

Difference of Age 57 years.

COMMUTATION TABLES FOR JOINT ANNUITIES.

Difference of Age 49 years.

AGES.		D _{x,y}	N _{x,y}	AGES.		D _{x,y}	N _{x,y}
(x)	(y)			(x)	(y)		
49	0	10474084.	112337631.3	103	54	591.8369	780.1337
50	1	8486271.3	101863547.3	104	55	188.2968	188.2968
51	2	7473342.0	93377276.0	Difference of Age 56 years.			
52	3	6687677.3	85303334.0	56	0	7641443.5	69679725.9
53	4	6151574.2	79216256.7	57	1	6157846.8	62038282.4
54	5	5707186.6	73064682.5	58	2	5381732.3	55880435.6
55	6	5350364.6	67357495.9	59	3	4767519.5	50498703.3
56	7	5038767.8	62007131.3	60	4	4327126.8	45731183.8
57	8	4756847.5	56968363.5	61	5	3943779.1	41404057.0
58	9	4492041.1	52211516.0	62	6	3626170.1	37460277.9
59	10	4234008.2	47719474.9	63	7	3347232.1	33834107.8
60	11	3976529.4	43485466.7	64	8	3097947.4	30486875.7
61	12	3713430.4	39508937.3	65	9	2869095.7	27388928.3
62	13	3458875.3	35795506.9	66	10	2657505.7	24519832.6
63	14	3215759.1	32336631.6	67	11	2459353.6	21862326.9
64	15	2986087.6	29120872.5	68	12	2270736.1	19402973.3
65	16	2766580.6	26134784.9	69	13	2091683.3	17132237.2
66	17	2558363.5	23368204.3	70	14	1921025.1	15040553.9
67	18	2361836.0	20809840.8	71	15	1758978.8	13119528.8
68	19	2176003.9	18448004.8	72	16	1597297.0	11360550.0
69	20	2000369.2	16272000.9	73	17	1435427.3	9763253.0
70	21	1833692.0	14271631.7	74	18	1275870.1	8327825.7
71	22	1676613.9	12437939.7	75	19	1119169.6	7051955.6
72	23	1521271.7	10761325.8	76	20	975889.92	5932785.99
73	24	1366645.0	9240054.1	77	21	843904.14	4956896.07
74	25	1214514.3	7873409.1	78	22	726223.50	4112991.93
75	26	1064972.1	6658894.8	79	23	623949.96	3386768.43
76	27	928297.25	5513922.75	80	24	530285.78	2762818.47
77	28	802176.45	4665625.50	81	25	448966.27	2232532.69
78	29	689096.00	3863449.05	82	26	374801.10	1783566.42
79	30	590361.50	3174353.05	83	27	310385.86	1408765.32
80	31	500193.57	2583991.55	84	28	253889.98	1098379.46
81	32	422161.18	2083797.98	85	29	205550.41	844489.48
82	33	351424.20	1661636.80	86	30	162966.30	638939.07
83	34	290239.98	1310212.60	87	31	126321.23	475972.77
84	35	236840.30	1019972.62	88	32	95143.746	349651.543
85	36	191445.43	783132.32	89	33	71336.478	254507.797
86	37	151672.47	591686.89	90	34	53789.431	183171.319
87	38	117477.61	440014.42	91	35	38223.342	129381.888
88	39	88396.938	322536.812	92	36	26235.278	91158.546
89	40	66160.933	234139.874	93	37	18145.706	64923.268
90	41	49738.095	167978.941	94	38	12908.114	46777.562
91	42	35215.089	118240.846	95	39	9294.155	33869.448
92	43	24070.015	83025.757	96	40	6835.8149	24575.2930
93	44	16580.289	58955.742	97	41	5126.4029	17739.4781
94	45	11747.527	42375.453	98	42	3817.7453	12613.0752
95	46	8427.352	30627.926	99	43	2870.4315	8795.3299
96	47	6179.8461	22200.5745	100	44	2246.8820	5924.8984
97	48	4626.9650	16020.7284	101	45	1671.5675	3678.0164
98	49	3445.2446	11393.7634	102	46	1142.0347	2006.4489
99	50	2592.1724	7948.5188	103	47	655.4061	864.4142
100	51	2031.4660	5356.3464	104	48	209.0081	209.0081
101	52	1512.0844	3324.8804				
102	53	1032.6623	1812.7960				

Difference of Age 56 years.

COMMUTATION TABLES FOR JOINT ANNUITIES.

Difference of Age 50 years.

AGES.		D _{xy}	N _{xy}	AGES.		D _{xy}	N _{xy}
(x)	(y)			(x)	(y)		
50	0	10029868.	105472491.2	104	54	191.5330	191.5330
51	1	8128544.4	95442623.2	Difference of Age 55 years.			
52	2	7151971.6	87314078.8	55	0	8014326.8	75037824.6
53	3	6394191.3	80162107.2	56	1	6465425.3	67023497.8
54	4	5875958.7	73767915.9	57	2	5661492.8	60558072.5
55	5	5447337.9	67891957.2	58	3	5032359.0	54896579.7
56	6	5101427.7	62444619.3	59	4	4586623.8	49864220.7
57	7	4799059.5	57343191.6	60	5	4202840.9	45277596.9
58	8	4521789.8	52544132.1	61	6	3873572.1	41074756.0
59	9	4255637.1	48022342.3	62	7	3581630.6	37201183.9
60	10	3994461.2	43766705.2	63	8	3317790.3	33619553.3
61	11	3731417.3	39772244.0	64	9	3077566.2	30301763.0
62	12	3476256.6	36040826.7	65	10	2854513.8	27224196.8
63	13	3232510.5	32564570.1	66	11	2645575.7	24369683.0
64	14	3002677.0	29332059.6	67	12	2447498.5	21724107.3
65	15	2783813.8	26329382.6	68	13	2259382.4	19276608.8
66	16	2575641.4	23545568.8	69	14	2080843.8	17017226.4
67	17	2378280.2	20969927.4	70	15	1910411.7	14936382.6
68	18	2191260.4	18591647.2	71	16	1748089.9	13025970.9
69	19	2014493.3	16400386.8	72	17	1586582.1	11277881.0
70	20	1846731.4	14385893.5	73	18	1425502.4	9691298.9
71	21	1688340.5	12539162.1	74	19	1266986.9	8265796.5
72	22	1531986.7	10850821.6	75	20	1111322.9	6998809.6
73	23	1376339.2	9318834.9	76	21	968999.4	5887486.7
74	24	1223190.8	7942495.7	77	22	838042.73	4918487.29
75	25	1072818.9	6719304.9	78	23	721144.17	4080444.56
76	26	935187.78	5646486.05	79	24	619555.21	3359300.39
77	27	808456.53	4711298.27	80	25	526524.26	2739745.18
78	28	695142.83	3902841.74	81	26	445682.46	2213220.92
79	29	596221.17	3207698.91	82	27	372039.55	1767538.46
80	30	505298.50	2611477.74	83	28	307974.78	1395498.91
81	31	426514.14	2106179.24	84	29	251681.47	1087524.13
82	32	355020.65	1679665.10	85	30	203530.26	835842.66
83	33	293186.85	1324644.45	86	31	161319.89	632312.40
84	34	239269.66	1031457.60	87	32	125032.01	470992.51
85	35	193429.51	792187.94	88	33	94179.916	345960.502
86	36	153290.00	598758.43	89	34	70619.462	251780.586
87	37	118766.83	445468.43	90	35	53243.295	181161.124
88	38	89395.191	326701.603	91	36	37831.271	127917.829
89	39	66956.168	237306.412	92	37	25958.441	90086.558
90	40	50393.458	170350.244	93	38	17948.733	64128.117
91	41	35706.960	119956.786	94	39	12763.973	46179.384
92	42	24421.005	84249.826	95	40	9183.7687	33415.4112
93	43	16825.642	59828.821	96	41	6746.9156	24231.6425
94	44	11923.976	43003.179	97	42	5055.7857	17484.7269
95	45	8554.0246	31079.2030	98	43	3762.8748	12428.9412
96	46	6272.7862	22525.1784	99	44	2828.5748	8666.0664
97	47	4695.5354	16252.3922	100	45	2213.6330	5837.4916
98	48	3493.9325	11556.8568	101	46	1646.8141	3623.8586
99	49	2628.1339	8062.9243	102	47	1125.1139	1977.0445
100	50	2059.0955	5434.7904	103	48	645.8350	851.9306
101	51	1534.0089	3375.6949	104	49	206.0956	206.0956
102	52	1048.6022	1841.6860				
103	53	601.5508	793.0838				

Difference of Age 55 years.

COMMUTATION TABLES FOR JOINT ANNUITIES.

Difference of Age 51 years.

AGES.		$D_{x,y}$	$N_{x,y}$	AGES.		$D_{x,y}$	$N_{x,y}$
(x)	(y)			(x)	(y)		
51	0	9607072.9	98880982.8	Difference of Age 54 years.			
52	1	7778998.8	89273909.9	54	0	8396625.8	80630200.7
53	2	6838110.3	81494911.1	55	1	6780921.9	72233574.9
54	3	6107705.6	74656800.8	56	2	5944278.9	65452653.0
55	4	5608425.9	68549095.2	57	3	5293957.9	59508374.1
56	5	5193889.1	62940669.3	58	4	4841414.4	54214416.2
57	6	4858738.4	57746780.2	59	5	4454884.5	49373001.8
58	7	4561915.8	52888041.8	60	6	4128022.1	44918117.3
59	8	4283820.1	48326126.0	61	7	3825993.7	40790095.2
60	9	4014866.3	44042305.9	62	8	3550127.0	36964101.5
61	10	3748243.8	40027439.6	63	9	3295962.7	33413974.5
62	11	3493094.7	36279195.8	64	10	3061924.7	30118011.8
63	12	3248754.2	32786101.1	65	11	2841699.4	27056087.1
64	13	3018318.4	29537346.9	66	12	2632823.0	24214387.7
65	14	2799279.4	26519028.5	67	13	2435261.0	21581564.7
66	15	2591685.1	23719749.1	68	14	2247674.0	19146303.7
67	16	2394341.9	21128064.0	69	15	2069347.4	16898629.7
68	17	2206516.9	18733722.1	70	16	1898585.4	14829282.3
69	18	2028617.4	16527205.2	71	17	1736363.4	12930696.9
70	19	1859770.7	14498587.8	72	18	1575612.0	11194333.5
71	20	1700346.2	12638817.1	73	19	1415577.4	9618721.5
72	21	1542701.7	10938470.9	74	20	1258103.7	8203144.1
73	22	1386033.3	9395769.2	75	21	1103476.1	6945040.4
74	23	1231867.4	8009735.9	76	22	962269.12	5841564.26
75	24	1080483.2	6777868.5	77	23	832181.31	4879295.14
76	25	942078.3	5697385.3	78	24	716064.84	4047113.83
77	26	814457.5	4755307.0	79	25	615160.45	3331048.99
78	27	700584.97	3940849.52	80	26	522673.17	2715888.54
79	28	601453.02	3240264.55	81	27	442398.64	2193215.37
80	29	510313.87	2638811.53	82	28	369149.54	1750816.73
81	30	430867.11	2128497.66	83	29	305295.81	1381667.19
82	31	358681.32	1697630.55	84	30	249207.94	1076371.38
83	32	296187.30	1338949.23	85	31	201474.04	827163.44
84	33	241699.02	1042761.93	86	32	159673.47	625689.40
85	34	195413.58	801062.91	87	33	123765.40	466015.93
86	35	154878.65	605649.33	88	34	93233.298	342250.532
87	36	120033.44	450770.68	89	35	69902.447	249017.234
88	37	90376.231	330737.241	90	36	52697.159	179114.787
89	38	67712.293	240361.010	91	37	37432.072	126417.628
90	39	50999.173	172648.717	92	38	25676.660	88985.556
91	40	36177.445	121649.544	93	39	17748.305	63308.896
92	41	24762.108	85472.099	94	40	12612.376	45560.591
93	42	17070.994	60709.991	95	41	9064.3345	32948.2146
94	43	12100.425	43638.997	96	42	6653.9754	23883.8801
95	44	8682.5069	31538.5720	97	43	4983.1215	17229.9047
96	45	6367.0733	22856.0651	98	44	3708.0044	12246.7832
97	46	4766.1526	16488.9918	99	45	2786.7180	8538.7788
98	47	3545.7116	11722.8392	100	46	2180.8523	5752.0608
99	48	2665.2744	8177.1276	101	47	1622.4142	3571.2085
100	49	2087.6615	5511.8532	102	48	1108.6835	1948.7943
101	50	1554.8725	3424.1917	103	49	636.8353	840.1108
102	51	1063.8064	1869.3192	104	50	203.2755	203.2755
103	52	610.8362	805.5128				
104	53	194.6766	194.6766				

Difference of Age 54 years.

COMMUTATION TABLES FOR JOINT ANNUITIES.

Difference of Age 52 years.

AGES.		D_{xy}	N_{xy}	AGES.		D_{xy}	N_{xy}
(x)	(y)			(x)	(y)		
Difference of Age 53 years.							
52	0	9193947.3	92546680.2	53	0	8790474.7	86464762.0
53	1	7437620.6	83352732.9	54	1	7104385.1	77674287.3
54	2	6531735.2	75915112.3	55	2	6234344.8	70569902.2
55	3	5829621.3	69383377.1	56	3	5558386.0	64335557.4
56	4	5347482.1	63553755.8	57	4	5093087.4	58777171.4
57	5	4946801.2	58206273.7	58	5	4702357.0	53684084.0
58	6	4618645.7	53259472.5	59	6	4375578.8	48981727.0
59	7	4321834.4	48640826.8	60	7	4077318.4	44606148.2
60	8	4041454.8	44318992.4	61	8	3792340.8	40528829.8
61	9	3767391.2	40277537.6	62	9	3526770.9	36736489.0
62	10	3508846.5	36510146.4	63	10	3279211.3	33209718.1
63	11	3264490.4	33001299.9	64	11	3048179.3	29930506.8
64	12	3033485.8	29736809.5	65	12	2828001.3	26882327.5
65	13	2813861.3	26703323.7	66	13	2619658.9	24054326.2
66	14	2606083.4	23889462.4	67	14	2422641.1	21434667.3
67	15	2409256.3	21283379.0	68	15	2235255.9	19012026.2
68	16	2221418.6	18874122.7	69	16	2056537.2	16776770.3
69	17	2042741.6	16652704.1	70	17	1885849.3	14720233.1
70	18	1872810.0	14609962.5	71	18	1724357.7	12834383.8
71	19	1712351.9	12737152.5	72	19	1564641.9	11110026.1
72	20	1553671.8	11024800.6	73	20	1405652.4	9545384.2
73	21	1395727.5	9471128.8	74	21	1249220.6	8139731.8
74	22	1240544.0	8075401.3	75	22	1095811.8	6890511.2
75	23	1088147.5	6834857.3	76	23	955538.84	5794699.45
76	24	948808.56	5746709.82	77	24	826319.90	4839160.61
77	25	820458.48	4797901.26	78	25	710985.51	4012840.71
78	26	705785.24	3977442.78	79	26	610661.07	3301855.20
79	27	606161.67	3271657.54	80	27	518822.08	2691194.13
80	28	514791.87	2665495.87	81	28	438962.09	2172372.05
81	29	435143.70	2150704.00	82	29	365938.43	1733409.96
82	30	362341.98	1715560.30	83	30	302295.36	1367471.53
83	31	299241.33	1353218.32	84	31	246690.24	1065176.17
84	32	244172.54	1053976.99	85	32	199417.81	818485.93
85	33	197397.66	809804.45	86	33	158055.94	619068.12
86	34	156467.29	612406.79	87	34	122521.41	461012.18
87	35	121277.43	455939.50	88	35	92286.68	338490.77
88	36	91340.062	334662.075	89	36	69185.432	246204.088
89	37	68455.381	243322.013	90	37	52141.094	177018.656
90	38	51575.098	174866.632	91	38	37025.744	124877.562
91	39	36612.287	123291.534	92	39	25389.936	87851.818
92	40	25088.381	86679.247	93	40	17537.509	62461.882
93	41	17309.435	61590.866	94	41	12448.353	44924.373
94	42	12276.874	44281.431	95	42	8939.4714	32476.0197
95	43	8810.9892	32004.5566	96	43	6558.3414	23536.5483
96	44	6462.7074	23193.5674	97	44	4910.4575	16978.2069
97	45	4837.7934	16730.8600	98	45	3653.1340	12067.7494
98	46	3599.0364	11893.0666	99	46	2745.4507	8414.6154
99	47	2704.7730	8294.0302	100	47	2148.5399	5669.1647
100	48	2117.1641	5589.2572	101	48	1598.7216	3520.6248
101	49	1576.4434	3472.0931	102	49	1093.2340	1921.9032
102	50	1078.2750	1895.6497	103	50	628.1213	828.6692
103	51	619.6931	817.3747	104	51	200.5479	200.5479
104	52	197.6816	197.6816				

Difference of Age 53 years.

COMMUTATION TABLES

FOR

JOINT ANNUITIES.

TABLE XXXVI.

CARLISLE MORTALITY, THREE AND A HALF PER CENT.

CARLISLE 3½ PER CENT.
COMMUTATION TABLES FOR JOINT ANNUITIES.

Equal Ages.

AGES.		D _{x,y}	N _{x,y}	AGES.		D _{x,y}	N _{x,y}
(x)	(y)			(x)	(y)		
0	0	100000000.	1062899117.	54	54	2678249.2	27122770.5
1	1	69167653.	962899117.	55	55	2500976.4	24444521.3
2	2	56489384.	893731464.	56	56	2330560.6	21943541.9
3	3	47722759.	837242080.	57	57	2166995.8	19612984.3
4	4	42676272.	789519321.	58	58	2007125.1	17445988.5
5	5	38898494.	746843049.	59	59	1846504.0	15438863.4
6	6	36256891.	707944555.	60	60	1684602.2	13592359.4
7	7	34175544.	671687664.	61	61	1520445.0	11907757.2
8	8	32441527.	637512120.	62	62	1365770.9	10387312.2
9	9	30933400.	605070593.	63	63	1222706.0	9021541.3
10	10	29584316.	574137193.	64	64	1092713.7	7798835.3
11	11	28327821.	544552877.	65	65	973454.67	6706121.63
12	12	27106644.	516225056.	66	66	864836.42	5732666.96
13	13	25928749.	489118412.	67	67	766072.04	4867830.54
14	14	24792957.	463189663.	68	68	675915.14	4101758.50
15	15	23690589.	438396706.	69	69	593797.86	3425843.36
16	16	22606941.	414706117.	70	70	518752.07	2832045.50
17	17	21550392.	392099176.	71	71	450776.46	2313293.43
18	18	20534696.	370548784.	72	72	385779.52	1862516.97
19	19	19564974.	350014088.	73	73	323676.07	1476737.45
20	20	18639214.	330449114.	74	74	265779.63	1153061.38
21	21	17755487.	311809900.	75	75	212570.70	887281.75
22	22	16917583.	294054413.	76	76	168019.11	674711.05
23	23	16117644.	277136830.	77	77	130626.71	506691.94
24	24	15354007.	261019186.	78	78	100548.20	376065.23
25	25	14625077.	245665179.	79	79	77154.944	275517.026
26	26	13924559.	231040102.	80	80	57937.242	198362.082
27	27	13256156.	217115543.	81	81	43179.995	140424.840
28	28	12609670.	203859387.	82	82	31301.657	97244.845
29	29	11972222.	191249717.	83	83	22331.971	65943.188
30	30	11341113.	179277495.	84	84	15556.861	43611.217
31	31	10737310.	167936382.	85	85	10636.293	28054.356
32	32	10163537.	157199072.	86	86	6989.7568	17418.0627
33	33	9621895.3	147035535.2	87	87	4393.1195	10428.3059
34	34	9110574.9	137413639.9	88	88	2607.5053	6035.1864
35	35	8624647.9	128303065.0	89	89	1533.4373	3427.6811
36	36	8162920.7	119678417.1	90	90	911.89582	1894.24383
37	37	7721311.9	111515496.4	91	91	481.73344	982.34801
38	38	7299121.5	103794184.5	92	92	237.47088	500.61457
39	39	6895668.6	96495063.0	93	93	118.94194	263.14369
40	40	6505161.9	89599394.4	94	94	63.05610	144.20175
41	41	6122766.7	83094232.5	95	95	34.26962	81.14564
42	42	5753859.1	76971465.8	96	96	19.46176	46.87602
43	43	5400631.0	71217606.7	97	97	11.51678	27.41426
44	44	5066932.2	65816975.7	98	98	6.73134	15.89748
45	45	4751770.4	60750043.5	99	99	4.01505	9.16614
46	46	4456115.0	55998273.1	100	100	2.59687	5.15109
47	47	4178788.4	51542158.1	101	101	1.51782	2.55422
48	48	3920416.7	47363369.7	102	102	.74821	1.03640
49	49	3683010.8	43442953.0	103	103	.26025	.28819
50	50	3461747.9	39759942.2	104	104	.02794	.02794
51	51	3255526.7	36298194.3				
52	52	3056167.9	33042667.6				
53	53	2863729.2	29986499.7				

Equal Ages.

COMMUTATION TABLES FOR JOINT ANNUITIES.

Difference of Age 1 year.

AGES.		D _{x,y}	N _{x,y}	AGES.		D _{x,y}	N _{x,y}
(x)	(y)			(x)	(y)		
1	0	81748792.	993349782.	55	54	2543959.0	25304019.6
2	1	61441918.	911600990.	56	55	2373093.3	22760060.6
3	2	51035928.	850159072.	57	56	2208966.1	20386967.3
4	3	44359417.	799123144.	58	57	2049963.2	18178001.2
5	4	40048795.	754763727.	59	58	1892309.5	16128038.0
6	5	36914033.	714714932.	60	59	1733618.9	14235728.5
7	6	34600536.	677800899.	61	60	1573127.3	12502109.6
8	7	32729411.	643200363.	62	61	1416459.4	10928982.3
9	8	31138257.	610470952.	63	62	1270222.5	9512522.9
10	9	29735443.	579332695.	64	63	1136171.9	8242300.4
11	10	28455563.	549597252.	65	64	1013773.4	7106128.5
12	11	27237942.	521141683.	66	65	901892.3	6092355.1
13	12	26059044.	493903747.	67	66	800076.68	5190462.79
14	13	24922108.	467844703.	68	67	707311.49	4390386.11
15	14	23822203.	442922595.	69	68	622723.46	3683074.62
16	15	22747761.	419100392.	70	69	545543.08	3060351.16
17	16	21695932.	396352631.	71	70	475324.67	2514808.08
18	17	20677668.	374656699.	72	71	409901.99	2039483.41
19	18	19702149.	353979031.	73	72	347339.93	1629581.42
20	19	18770820.	334276882.	74	73	288300.88	1282241.49
21	20	17881745.	315506062.	75	74	233637.41	993940.61
22	21	17035908.	297624317.	76	75	185763.70	760303.20
23	22	16231168.	280588409.	77	76	145621.38	574539.50
24	23	15462919.	264357241.	78	77	112650.46	428918.12
25	24	14729560.	248894322.	79	78	86576.269	316267.657
26	25	14027156.	234164762.	80	79	65718.950	229691.388
27	26	13354553.	220137606.	81	80	49164.319	163972.438
28	27	12708389.	206783053.	82	81	36137.224	114808.119
29	28	12077278.	194074664.	83	82	25988.249	78670.895
30	29	11453680.	181997386.	84	83	18321.218	52682.646
31	30	10846895.	170543706.	85	84	12644.043	34361.428
32	31	10268335.	159696811.	86	85	8475.3183	21717.3848
33	32	9720364.9	149428476.3	87	86	5446.8745	13242.0665
34	33	9203076.6	139708111.4	88	87	3326.8171	7795.1920
35	34	8713114.0	130505034.8	89	88	1965.5108	4468.3749
36	35	8247518.5	121791920.8	90	89	1162.3461	2502.8641
37	36	7803656.9	113544402.3	91	90	651.48712	1340.51799
38	37	7379223.4	105740745.4	92	91	332.45923	689.03087
39	38	6973540.3	98361522.0	93	92	165.19714	356.57164
40	39	6583352.0	91387981.7	94	93	85.12574	191.37450
41	40	6203442.0	84804629.7	95	94	45.69283	106.24876
42	41	5834226.7	78601187.7	96	95	25.38490	60.55593
43	42	5479383.3	72766961.0	97	96	14.71589	35.17103
44	43	5141911.9	67287577.7	98	97	8.65459	20.45514
45	44	4823142.4	62145665.8	99	98	5.11006	11.80055
46	45	4523095.5	57322523.4	100	99	3.17395	6.69049
47	46	4241634.2	52799427.9	101	100	1.95149	3.51654
48	47	3978516.2	48557793.7	102	101	1.04750	1.56506
49	48	3735058.7	44579277.5	103	102	.43375	.51756
50	49	3509773.1	40844218.8	104	103	.08382	.08382
51	50	3299804.2	37334445.7	Difference of Age 104 years.			
52	51	3100480.9	34034641.5				
53	52	2907933.1	30934160.6				
54	53	2722207.9	28026227.5	104	0	279.38540	279.38540

Difference of Age 104 years.

COMMUTATION TABLES FOR JOINT ANNUITIES.

Difference of Age 2 years.

AGES.		D _{x,y}	N _{x,y}	AGES.		D _{x,y}	N _{x,y}
(x)	(y)			(x)	(y)		
2	0	72617797.	939450087.	56	54	2413878.1	23549613.4
3	1	55510347.	866832290.	57	55	2249279.7	21135735.3
4	2	47439086.	811321943.	58	56	2089666.9	18886455.6
5	3	41628313.	763882857.	59	57	1932697.1	16796788.7
6	4	38005650.	722254544.	60	58	1776624.1	14864091.6
7	5	35227657.	684248894.	61	59	1618900.4	13087467.5
8	6	33136419.	649021237.	62	60	1465533.6	11468567.1
9	7	31414576.	615884818.	63	61	1317354.8	10003028.5
10	8	29932367.	584470242.	64	62	1180325.5	8685663.7
11	9	28600324.	554537875.	65	63	1054092.1	7505338.2
12	10	27360769.	525936951.	66	64	939247.01	6451246.09
13	11	26185267.	498576182.	67	65	834357.78	5511999.08
14	12	25047345.	472390915.	68	66	738707.86	4677641.30
15	13	23946297.	447343570.	69	67	651649.06	3938933.44
16	14	22874137.	423397273.	70	68	572118.06	3287284.38
17	15	21831077.	400523136.	71	69	499872.89	2715166.32
18	16	20817314.	378692059.	72	70	432224.28	2215293.43
19	17	19839324.	357874745.	73	71	369058.80	1783069.15
20	18	18902427.	338035421.	74	72	309378.46	1414010.35
21	19	18008004.	319132994.	75	73	253435.04	1104631.89
22	20	17157049.	301124990.	76	74	204173.71	851196.85
23	21	16344691.	283967941.	77	75	161000.54	647023.14
24	22	15571831.	267623250.	78	76	125581.64	486022.60
25	23	14834042.	252051419.	79	77	96996.826	360440.964
26	24	14127367.	237217377.	80	78	73743.836	263444.138
27	25	13452950.	223090010.	81	79	55767.711	189700.302
28	26	12802720.	209637060.	82	80	41145.489	133932.591
29	27	12171829.	196834340.	83	81	30002.986	92787.102
30	28	11554186.	184662511.	84	82	21320.840	62784.116
31	29	10954556.	173108325.	85	83	14890.811	41463.276
32	30	10373132.	162153769.	86	84	10075.154	26572.465
33	31	9820593.	151780637.	87	85	6604.5209	16497.3113
34	32	9297260.2	141960044.2	88	86	4124.8036	9892.7904
35	33	8801580.2	132662784.0	89	87	2507.7207	5767.9868
36	34	8332116.3	123861203.8	90	88	1489.8580	3260.2661
37	35	7884531.5	115529087.5	91	89	830.41669	1770.40806
38	36	7457920.2	107644556.0	92	90	449.61154	939.99137
39	37	7050069.2	100186635.8	93	91	231.27599	490.37983
40	38	6657696.7	93136566.6	94	92	118.23019	259.10384
41	39	6278005.5	86478869.9	95	93	61.68532	140.87365
42	40	5911100.1	80200864.4	96	94	33.84654	79.18833
43	41	5555917.2	74289764.3	97	95	19.19463	45.34179
44	42	5216891.4	68733847.1	98	96	11.05864	26.14716
45	43	4894514.6	63516955.7	99	97	6.57008	15.08852
46	44	4591032.8	58622441.1	100	98	4.03957	8.51844
47	45	4305390.8	54031408.3	101	99	2.38515	4.47887
48	46	4038350.0	49726017.5	102	100	1.34678	2.09372
49	47	3790411.3	45687667.5	103	101	.60724	.74694
50	48	3559372.8	41897256.2	104	102	.13969	.13969
51	49	3345582.7	38337883.4	Difference of Age 103 years.			
52	50	3142649.7	34992300.7				
53	51	2950096.7	31849651.0				
54	52	2764227.3	28899554.3	103	0	867.49150	1103.87949
55	53	2585713.6	26135327.0	104	1	236.38799	236.38799

Difference of Age 103 years.

COMMUTATION TABLES FOR JOINT ANNUITIES.

Difference of Age 3 years.

AGES.		$D_{x,y}$	$N_{x,y}$	AGES.		$D_{x,y}$	$N_{x,y}$
(x)	(y)			(x)	(y)		
3	0	65607312.	892661651.	57	54	2287936.6	21859023.9
4	1	51598162.	827054339.	58	55	2127803.3	19571087.3
5	2	44518374.	775456177.	59	56	1970129.6	17443284.0
6	3	39504587.	730937803.	60	57	1814542.7	15473154.4
7	4	36269405.	691433216.	61	58	1659059.8	13658611.7
8	5	33737004.	655163811.	62	59	1508181.2	11999551.9
9	6	31805233.	621426807.	63	60	1363010.5	10491370.7
10	7	30197985.	589621574.	64	61	1224131.4	9128360.2
11	8	28790334.	559423589.	65	62	1095055.9	7904228.8
12	9	27500537.	530633255.	66	63	976601.73	6809172.88
13	10	26303347.	503132718.	67	64	868915.35	5832571.15
14	11	25168668.	476829371.	68	65	770359.47	4963655.80
15	12	24066630.	451660703.	69	66	680574.66	4193296.33
16	13	22993292.	427594073.	70	67	598693.04	3512721.67
17	14	21952361.	404600781.	71	68	524223.14	2914028.63
18	15	20946986.	382648420.	72	69	454546.56	2389805.49
19	16	19973309.	361701434.	73	70	389156.86	1935258.93
20	17	19034034.	341728125.	74	71	328723.64	1546102.07
21	18	18134263.	322694091.	75	72	271963.59	1217378.43
22	19	17278191.	304559828.	76	73	221474.69	945414.84
23	20	16460918.	287281637.	77	74	176956.41	723940.15
24	21	15680743.	270820719.	78	75	138844.39	546983.74
25	22	14938525.	255139976.	79	76	108131.12	408139.35
26	23	14227578.	240201451.	80	77	82619.844	300008.234
27	24	13549059.	225973873.	81	78	62577.459	217388.390
28	25	12897051.	212424814.	82	79	46671.851	154810.931
29	26	12262177.	199527763.	83	80	34161.105	108139.080
30	27	11644641.	187265586.	84	81	24614.542	73977.975
31	28	11050682.	175620945.	85	82	17328.793	49363.433
32	29	10476091.	164570263.	86	83	11865.446	32034.640
33	30	9920821.2	154094172.2	87	84	7851.217	20169.194
34	31	9393125.5	144173351.0	88	85	5001.4649	12317.9773
35	32	8891654.7	134780225.5	89	86	3109.2348	7316.5124
36	33	8416714.2	125888570.8	90	87	1900.8533	4207.2776
37	34	7965406.0	117471856.6	91	88	1064.4015	2306.4243
38	35	7535211.6	109506450.6	92	89	573.09639	1242.02281
39	36	7125255.7	101971239.0	93	90	312.77325	668.92642
40	37	6730759.7	94845983.3	94	91	165.52227	356.15317
41	38	6348902.0	88115223.6	95	92	85.67405	190.63090
42	39	5982149.9	81766321.6	96	93	45.69283	104.95684
43	40	5629123.5	75784171.7	97	94	25.59285	59.26402
44	41	5289759.0	70155048.2	98	95	14.42431	33.67117
45	42	4965886.6	64865289.2	99	96	8.39510	19.24686
46	43	4658970.1	59899402.6	100	97	5.19374	10.85176
47	44	4370058.2	55240432.5	101	98	3.03564	5.65802
48	45	4099051.0	50870374.3	102	99	1.64607	2.62238
49	46	3847416.2	46771323.3	103	100	.78074	.97631
50	47	3612121.8	42923907.1	104	101	.19557	.19557
51	48	3392862.2	39311785.3	Difference of Age 102 years.			
52	49	3186248.0	35918923.1				
53	50	2990220.2	32732675.1	102	0	1496.4229	2447.74137
54	51	2804307.2	29742454.9	103	1	733.96456	951.31847
55	52	2625626.1	26938147.7	104	2	217.33391	217.33391
56	53	2453497.7	24312521.6				

Difference of Age 102 years.

COMMUTATION TABLES FOR JOINT ANNUITIES.

Difference of Age 4 years.

AGES.		D _{x,y}	N _{x,y}	AGES.		D _{x,y}	N _{x,y}
(x)	(y)			(x)	(y)		
4	0	60983527.	851365352.	58	54	2164372.5	20231771.2
5	1	48421386.	790381825.	59	55	2006084.5	18067398.7
6	2	42247207.	741960439.	60	56	1849686.7	16061314.2
7	3	37699865.	699713232.	61	57	1694469.3	14211627.5
8	4	34734670.	662013367.	62	58	1545594.1	12517158.2
9	5	32381691.	627278697.	63	59	1402669.8	10971564.1
10	6	30573513.	594897006.	64	60	1266546.6	9568894.3
11	7	29045817.	564323493.	65	61	1135697.1	8302347.7
12	8	27682660.	535277676.	66	62	1014554.1	7166650.6
13	9	26437714.	507595016.	67	63	903472.91	6152096.50
14	10	25282163.	481157302.	68	64	802266.34	5248623.59
15	11	24183202.	455875139.	69	65	709735.42	4446357.25
16	12	23108836.	431691937.	70	66	625268.01	3736621.83
17	13	22066714.	408583101.	71	67	548573.37	3111353.82
18	14	21063358.	386516387.	72	68	476688.83	2562780.45
19	15	20097723.	365453029.	73	69	409254.93	2086091.62
20	16	19162581.	345355306.	74	70	346625.15	1676836.69
21	17	18260521.	326192725.	75	71	288969.25	1330211.54
22	18	17399333.	307932204.	76	72	237666.63	1041242.29
23	19	16577144.	290532871.	77	73	191951.09	803575.66
24	20	15792248.	273955727.	78	74	152604.49	611624.57
25	21	15043008.	258163479.	79	75	119550.91	459020.08
26	22	14327789.	243120471.	80	76	92103.801	339469.168
27	23	13645168.	228792682.	81	77	70109.454	247365.367
28	24	12989189.	215147514.	82	78	52370.911	177255.913
29	25	12352526.	202158325.	83	79	38749.376	124885.002
30	26	11731077.	189805799.	84	80	28025.876	86135.626
31	27	11137196.	178074722.	85	81	20005.792	58109.750
32	28	10568019.	16637526.	86	82	13808.103	38103.958
33	29	10019291.	156369507.	87	83	9246.3293	24295.8551
34	30	9488991.	146350216.	88	84	5945.5616	15049.5258
35	31	8983337.9	136861225.3	89	85	3770.0531	9103.9642
36	32	8502850.0	127877887.4	90	86	2356.8012	5333.9111
37	33	8046280.5	119375037.4	91	87	1358.0295	2977.1099
38	34	7612503.1	111328756.9	92	88	734.57659	1619.08043
39	35	7199099.5	103716253.8	93	89	398.67576	884.50384
40	36	6802540.7	96517154.3	94	90	223.84917	485.82808
41	37	6418576.2	89714613.6	95	91	119.94367	261.97891
42	38	6049705.3	83296037.4	96	92	63.46226	142.03524
43	39	5696783.9	77246332.1	97	93	34.55034	78.57298
44	40	5359458.4	71549548.2	98	94	19.23241	44.02264
45	41	5035248.2	66190089.8	99	95	10.95013	24.79022
46	42	4726907.5	61154841.6	100	96	6.63644	13.84009
47	43	4434725.6	56427934.1	101	97	3.90297	7.20365
48	44	4160619.1	51993208.5	102	98	2.09499	3.30068
49	45	3905247.2	47832589.4	103	99	.95424	1.20569
50	46	3666445.3	43927342.2	104	100	.25145	.25145
51	47	3443143.5	40260896.9	Difference of Age 101 years.			
52	48	3231275.7	36817753.4	101	0	2168.3168	4312.48677
53	49	3031703.8	33586477.7	102	1	1266.1234	2144.16997
54	50	2842447.9	30554773.9	103	2	674.82163	878.04657
55	51	2663696.4	27712326.0	104	3	203.22494	203.22494
56	52	2491369.3	25048629.6				
57	53	2325489.1	22557260.3				

Difference of Age 101 years.

COMMUTATION TABLES FOR JOINT ANNUITIES.

Difference of Age 5 years.

AGES.		$D_{x,y}$	$N_{x,y}$	AGES.		$D_{x,y}$	$N_{x,y}$
(x)	(y)			(x)	(y)		
5	0	57228916.	813412463.	59	54	2040561.7	18669096.8
6	1	45951101.	756183547.	60	55	1883443.5	16628535.1
7	2	40317191.	710232446.	61	56	1727287.7	14745091.6
8	3	36104600.	669915255.	62	57	1578581.8	13017803.9
9	4	33339278.	633810655.	63	58	1437465.3	11439222.1
10	5	31127646.	600471377.	64	59	1303399.1	10001756.8
11	6	29407018.	569343731.	65	60	1175048.1	8698357.7
12	7	27928314.	539936713.	66	61	1052207.7	7523309.6
13	8	26612799.	512008399.	67	62	938583.39	6471101.86
14	9	25411314.	485395600.	68	63	834173.21	5532518.47
15	10	24292254.	459984286.	69	64	739131.36	4698345.26
16	11	23220770.	435692032.	70	65	652059.03	3959213.90
17	12	22177602.	412471262.	71	66	572923.62	3307154.87
18	13	21173080.	390293660.	72	67	498831.10	2734231.25
19	14	20209377.	369120580.	73	68	429190.92	2235400.15
20	15	19281945.	348911203.	74	69	364526.64	1806209.23
21	16	18383844.	329629258.	75	70	304705.82	1441682.59
22	17	17520475.	311245414.	76	71	252527.73	1136976.77
23	18	16693371.	293724939.	77	72	205984.57	884449.04
24	19	15903753.	277031568.	78	73	165535.67	678464.47
25	20	15149978.	261127815.	79	74	131398.94	512928.80
26	21	14428000.	245977837.	80	75	101830.93	381529.86
27	22	13741277.	231549837.	81	76	78157.338	279698.934
28	23	13081326.	217808560.	82	77	58674.417	201541.596
29	24	12440773.	204727234.	83	78	43481.030	142867.179
30	25	11817512.	192286461.	84	79	31790.107	99386.149
31	26	11219865.	180468949.	85	80	22778.399	67596.042
32	27	10650754.	169249084.	86	81	15941.217	44817.643
33	28	10107210.	158598330.	87	82	10760.174	28876.426
34	29	9583174.5	148491119.8	88	83	7002.0508	18116.2522
35	30	9075021.0	138907945.3	89	84	4481.7036	11114.2014
36	31	8590524.2	129832924.3	90	85	2857.7017	6632.4978
37	32	8128625.5	121242400.1	91	86	1683.7731	3774.7961
38	33	7689794.5	113113774.6	92	87	937.21841	2091.02305
39	34	7272943.2	105423980.1	93	88	511.00981	1153.80464
40	35	6873040.0	98151036.9	94	89	285.32887	642.79483
41	36	6487027.9	91277996.9	95	90	162.20954	357.46596
42	37	6116095.9	84790969.0	96	91	88.84717	195.25642
43	38	5761116.7	78674873.1	97	92	47.98659	106.40925
44	39	5423877.4	72913756.4	98	93	25.96376	58.42266
45	40	5101594.0	67489879.0	99	94	14.60018	32.45891
46	41	4792931.1	62388285.0	100	95	8.65623	17.85873
47	42	4499392.9	57595353.9	101	96	4.98713	9.20250
48	43	4222187.3	53095961.0	102	97	2.69356	4.21537
49	44	3963904.4	48873773.7	103	98	1.21449	1.52181
50	45	3721556.2	44909869.3	104	99	.30732	.30732
51	46	3494925.7	41188313.1	Difference of Age 100 years.			
52	47	3279162.4	37693387.4	100	0	2885.4101	6710.6175
53	48	3074547.5	34414225.0	101	1	1834.6128	3825.2074
54	49	2881881.4	31339677.5	102	2	1164.0674	1990.5946
55	50	2699924.6	28457796.1	103	3	631.0153	826.5272
56	51	2527493.0	25757871.5	104	4	195.5189	195.5189
57	52	2361384.8	23230378.5				
58	53	2199896.9	20868993.7				

Difference of Age 100 years.

COMMUTATION TABLES FOR JOINT ANNUITIES.

Difference of Age 6 years.

AGES.		D _{x,y}	N _{x,y}	AGES.		D _{x,y}	N _{x,y}
(x)	(y)			(x)	(y)		
6	0	54309303.	778127111.	60	54	1915813.0	17174836.0
7	1	43851877.	723817808.	61	55	1758810.7	15259023.0
8	2	38611175.	679965931.	62	56	1609155.8	13500212.3
9	3	34654174.	641354756.	63	57	1468145.2	11891056.5
10	4	32048149.	606700582.	64	58	1335732.1	10422911.3
11	5	29940009.	574652433.	65	59	1209238.4	9087179.2
12	6	28275618.	544712424.	66	60	1088665.9	7877940.8
13	7	26848959.	516436806.	67	61	973417.42	6789274.92
14	8	25579601.	489587847.	68	62	866590.59	5815857.50
15	9	24416348.	464008246.	69	63	768527.29	4949266.91
16	10	23325482.	439591898.	70	64	679066.12	4180739.62
17	11	22285025.	416266416.	71	65	597471.83	3501673.50
18	12	21279478.	393981391.	72	66	520973.36	2904201.67
19	13	20314651.	372701913.	73	67	449126.89	2383228.31
20	14	19389067.	352387262.	74	68	382283.79	1934101.42
21	15	18498357.	332998195.	75	69	320442.40	1551817.63
22	16	17638799.	314499838.	76	70	266279.78	1231375.23
23	17	16809597.	296861039.	77	71	218864.61	965095.45
24	18	1601525J.	280051442.	78	72	177637.92	746230.84
25	19	15256948.	264036183.	79	73	142533.23	568592.92
26	20	14530597.	248779235.	80	74	111922.84	426059.69
27	21	13837386.	234248638.	81	75	86411.578	314136.851
28	22	13173464.	220411252.	82	76	65409.670	227725.273
29	23	12529020.	207237788.	83	77	48714.525	162315.603
30	24	11901937.	194708768.	84	78	35671.971	113601.078
31	25	11302533.	182806831.	85	79	25837.828	77929.107
32	26	10729812.	171504298.	86	80	18150.513	52091.279
33	27	10186338.	160774486.	87	81	12422.436	33940.766
34	28	9667267.	150588148.	88	82	8148.454	21518.330
35	29	9165095.6	140920881.4	89	83	5278.0744	13369.8757
36	30	8678198.3	131755785.8	90	84	3397.1330	8091.8013
37	31	8212440.9	123077587.5	91	85	2041.6322	4694.6683
38	32	7768491.2	114865146.6	92	86	1162.0242	2653.0361
39	33	7346787.0	107096655.4	93	87	651.97803	1491.01193
40	34	6943539.3	99749868.4	94	88	365.72541	839.03390
41	35	6554257.3	92806329.1	95	89	206.76005	473.30849
42	36	6181321.8	86252071.8	96	90	120.15522	266.54844
43	37	5824340.4	80070750.0	97	91	67.18122	146.30322
44	38	5485128.4	74246409.6	98	92	36.06077	79.21200
45	39	5162913.6	68761281.2	99	93	19.71024	43.15122
46	40	4856084.1	63598367.6	100	94	11.54164	23.44099
47	41	4562238.7	58742243.5	101	95	6.50495	11.89935
48	42	4283755.4	54180044.8	102	96	3.44177	5.39440
49	43	4022561.6	49896289.4	103	97	1.56148	1.95262
50	44	3777454.3	45873727.8	104	98	.39114	.39114
51	45	3547458.4	42096273.5	Difference of Age 99 years.			
52	46	3328478.5	38548815.1	99	0	3650.0438	9663.5897
53	47	3120111.5	35220336.6	100	1	2441.3455	6013.5459
54	48	2922607.9	32100225.1	101	2	1686.7336	3572.2004
55	49	2737380.9	29177617.2	102	3	1088.4980	1885.4668
56	50	2561868.7	26440236.3	103	4	607.0705	796.9688
57	51	2395623.8	23878367.6	104	5	189.8983	189.8983
58	52	2233853.9	21482743.8				
59	53	2074053.9	19248889.9				

Difference of Age 99 years.

COMMUTATION TABLES FOR JOINT ANNUITIES.

Difference of Age 7 years.

AGES.		$D_{x,y}$	$N_{x,y}$	AGES.		$D_{x,y}$	$N_{x,y}$
(x)	(y)			(x)	(y)		
7	0	51828244.	744788535.	61	54	1789038.3	15753485.9
8	1	41996291.	692960291.	62	55	1638522.9	13964447.6
9	2	37060052.	650964000.	63	56	1496580.2	12325924.7
10	3	33312123.	613903948.	64	57	1364240.7	10829344.5
11	4	30825391.	580591825.	65	58	1239235.5	9465103.8
12	5	28788103.	549766434.	66	59	1120342.7	8225868.3
13	6	27182840.	520978331.	67	60	1007145.6	7105525.6
14	7	25806592.	493795491.	68	61	898752.71	6098380.01
15	8	24578046.	467988899.	69	62	798393.56	5199627.30
16	9	23444637.	443410853.	70	63	706073.19	4401233.74
17	10	22385517.	419966216.	71	64	622218.02	3695160.55
18	11	21382550.	397580699.	72	65	543295.65	3072942.53
19	12	20416735.	376198149.	73	66	469062.87	2529646.88
20	13	19490068.	355781414.	74	67	400040.93	2060584.01
21	14	18601126.	336291346.	75	68	336052.07	1660543.08
22	15	17748672.	317690220.	76	69	280031.84	1324491.01
23	16	16923121.	299941548.	77	70	230783.46	1044459.17
24	17	16126764.	283018427.	78	71	188745.47	813675.71
25	18	15363918.	266891663.	79	72	152953.79	624930.24
26	19	14633194.	251527745.	80	73	121406.79	471976.45
27	20	13935783.	236894551.	81	74	94975.353	350569.662
28	21	13265601.	222958768.	82	75	72317.622	255594.309
29	22	12617268.	209693167.	83	76	54306.479	183276.687
30	23	11986362.	197075899.	84	77	39965.546	128970.208
31	24	11383279.	185089537.	85	78	28992.863	89004.662
32	25	10808870.	173706258.	86	79	20588.358	60011.799
33	26	10261948.	162897388.	87	80	14144.064	39423.441
34	27	9742950.1	152635439.9	88	81	9407.2497	25279.3770
35	28	9245519.4	142892489.8	89	82	6142.2214	15872.1273
36	29	8764334.2	133646970.4	90	83	4000.7824	9729.9059
37	30	8296256.3	124882636.2	91	84	2427.0189	5729.1235
38	31	7848593.2	116586379.9	92	85	1408.9939	3302.1046
39	32	7421973.5	108737786.7	93	86	808.36466	1893.11071
40	33	7014038.6	101315813.2	94	87	466.61517	1084.74605
41	34	6621486.7	94301774.6	95	88	265.01840	618.13088
42	35	6245383.0	87680287.9	96	89	153.15559	353.11248
43	36	5886454.9	81434904.9	97	90	90.85460	199.95689
44	37	5545323.3	75548450.0	98	91	50.48508	109.10229
45	38	5221217.6	70003126.7	99	92	27.37533	58.61720
46	39	4914452.8	64781909.1	100	93	15.58121	31.24187
47	40	4622352.1	59867456.3	101	94	8.67327	15.66066
48	41	4343589.3	55245104.2	102	95	4.48927	6.98739
49	42	4081218.8	50901514.9	103	96	1.99523	2.49812
50	43	3833352.4	46820296.1	104	97	.50289	.50289
51	44	3600741.6	42986943.7	Difference of Age 98 years.			
52	45	3378509.3	39386202.1	98	0	4808.1032	13541.5477
53	46	3167035.6	36007692.8	99	1	3088.3020	8733.4445
54	47	2965920.2	32840657.2	100	2	2244.5605	5645.1425
55	48	2776065.3	29874737.0	101	3	1577.2336	3400.5820
56	49	2597403.8	27098671.7	102	4	1047.1967	1823.3484
57	50	2428206.0	24501261.9	103	5	589.6340	776.1517
58	51	2266243.8	22073055.9	104	6	186.5177	186.5177
59	52	2106068.5	19806812.1				
60	53	1947257.7	17700743.6				

Difference of Age 98 years.

COMMUTATION TABLES FOR JOINT ANNUITIES.

Difference of Age 8 years.

AGES.		D _{x,y}	N _{x,y}	AGES.		D _{x,y}	N _{x,y}
(x)	(y)			(x)	(y)		
8	0	49635139.	713037982.	62	54	1666683.1	14410603.5
9	1	40309179.	663402843.	63	55	1523892.8	12743920.4
10	2	35624829.	623093664.	64	56	1390663.3	11220027.6
11	3	32041140.	587468835.	65	57	1265684.6	9829364.3
12	4	29639421.	555427695.	66	58	1148134.6	8563679.7
13	5	27675519.	525788274.	67	59	1036450.4	7415545.1
14	6	26127511.	498112755.	68	60	929893.82	6379094.70
15	7	24796149.	471985244.	69	61	828024.66	5419200.88
16	8	23599899.	447189095.	70	62	733512.39	4621176.22
17	9	22499870.	423589196.	71	63	646964.20	3887663.83
18	10	21478973.	401089326.	72	64	565797.96	3240699.63
19	11	20515628.	379610353.	73	65	489160.94	2674901.67
20	12	19588008.	359094725.	74	66	417798.07	2185740.73
21	13	18698022.	339506717.	75	67	351661.74	1767942.66
22	14	17847275.	320808695.	76	68	293673.00	1416280.92
23	15	17028536.	302961420.	77	69	242702.30	1122607.92
24	16	16235676.	285932884.	78	70	199024.10	879905.62
25	17	15470889.	269697208.	79	71	162517.86	680881.52
26	18	14735792.	254226319.	80	72	130282.80	518363.66
27	19	14034180.	239490527.	81	73	103023.24	388080.86
28	20	13359933.	225456347.	82	74	79484.623	285057.621
29	21	12705515.	212096414.	83	75	60041.817	205572.998
30	22	12070787.	199390899.	84	76	44553.203	145531.181
31	23	11464025.	187320112.	85	77	32482.523	100977.978
32	24	10886089.	175856087.	86	78	23102.385	68495.455
33	25	10337559.	164969998.	87	79	16043.792	45393.070
34	26	9815269.6	154632439.3	88	80	10711.002	29349.278
35	27	9317900.8	144817169.7	89	81	7091.0887	18638.2760
36	28	8841241.3	135499268.9	90	82	4655.8062	11547.1873
37	29	8378601.3	126658027.6	91	83	2858.2851	6891.3811
38	30	7928695.2	118279426.3	92	84	1674.9613	4033.0960
39	31	7498502.6	110350731.1	93	85	980.16968	2358.13468
40	32	7085819.6	102852228.5	94	86	578.53976	1377.96500
41	33	6688716.1	95766408.9	95	87	338.12692	799.42524
42	34	6309444.2	89077692.8	96	88	196.30993	461.29832
43	35	5947460.2	82768248.6	97	89	115.80763	264.98939
44	36	5604462.2	76820788.4	98	90	68.27507	149.18077
45	37	5278516.2	71216326.2	99	91	38.32546	80.90570
46	38	4969950.9	65937810.0	100	92	21.64058	42.58024
47	39	4677911.4	60967859.1	101	93	11.70891	20.93966
48	40	4400821.6	56289947.7	102	94	5.98569	9.23075
49	41	4138223.7	51889126.1	103	95	2.60247	3.24506
50	42	3889250.6	47750902.4	104	96	.64259	.64259
51	43	3654024.7	43861651.8	Difference of Age 97 years.			
52	44	3429254.8	40207627.1				
53	45	3214639.7	36778372.3	97	0	6398.2116	18702.4348
54	46	3010525.3	33563732.6	98	1	4068.1361	12304.2232
55	47	2817205.9	30553207.3	99	2	2839.3691	8236.0871
56	48	2634116.1	27736001.4	100	3	2098.8473	5396.7180
57	49	2461892.7	25101885.3	101	4	1517.3881	3297.8707
58	50	2297066.4	22639992.6	102	5	1017.1186	1780.4826
59	51	2136605.5	20342926.2	103	6	579.1373	763.3640
60	52	1977315.1	18206320.7	104	7	184.2267	184.2267
61	53	1818402.1	16229005.6				

Difference of Age 97 years.

COMMUTATION TABLES FOR JOINT ANNUITIES.

Difference of Age 9 years.

AGES.		D_{xy}	N_{xy}	AGES.		D_{xy}	N_{xy}
(x)	(y)			(x)	(y)		
9	0	47641152.	682646037.	63	54	1550083.0	13145167.3
10	1	38748127.	635004885.	64	55	1416042.9	11595084.3
11	2	34265607.	596256758.	65	56	1290198.4	10179041.4
12	3	30808395.	561991151.	66	57	1172639.3	8888843.0
13	4	28493936.	531182756.	67	58	1062161.2	7716203.7
14	5	26601063.	502688820.	68	59	956950.84	6654042.47
15	6	25104503.	476087757.	69	60	856715.09	5697091.63
16	7	23809323.	450983254.	70	61	760735.53	4840376.54
17	8	22648876.	427173931.	71	62	672106.32	4079641.01
18	9	21588695.	404525055.	72	63	588300.27	3407534.69
19	10	20608142.	382936360.	73	64	509421.09	2819234.42
20	11	19682887.	362328218.	74	65	435699.58	2309813.33
21	12	18791982.	342645331.	75	66	367271.40	1874113.75
22	13	17940245.	323853349.	76	67	307314.15	1506842.35
23	14	17123139.	305913104.	77	68	254525.03	1199528.20
24	15	16336808.	288789965.	78	69	209302.73	945003.17
25	16	15575371.	272453157.	79	70	171368.20	735700.44
26	17	14838388.	25677786.	80	71	138429.28	564332.24
27	18	14132577.	242039398.	81	72	110555.23	425902.96
28	19	13454264.	227906821.	82	73	86219.876	315347.729
29	20	12795863.	214452557.	83	74	65992.230	229127.853
30	21	12155213.	201656694.	84	75	49258.492	163135.623
31	22	11544772.	189501481.	85	76	36211.201	113877.131
32	23	10963309.	177956709.	86	77	25883.051	77665.930
33	24	10411411.	166993400.	87	78	18002.885	51782.879
34	25	9887589.	156581989.	88	79	12149.626	33779.994
35	26	9387065.4	146694400.2	89	80	8073.8441	21630.3676
36	27	8910457.7	137307334.8	90	81	5375.0479	13556.5235
37	28	8452123.6	128396877.1	91	82	3326.2547	8181.4756
38	29	8007392.0	119944753.5	92	83	1972.5914	4855.2209
39	30	7575031.6	111937361.5	93	84	1165.1905	2882.6295
40	31	7158882.5	104362329.9	94	85	701.49915	1717.43902
41	32	6757167.9	97203447.4	95	86	419.23169	1015.93987
42	33	6373505.4	90446279.5	96	87	250.46439	596.70818
43	34	6008465.5	84072774.1	97	88	148.43851	346.24379
44	35	5662545.0	78064308.6	98	89	87.02667	197.80528
45	36	5334809.8	72401763.6	99	90	51.83062	110.77861
46	37	5024492.1	67066953.8	100	91	30.29681	58.94799
47	38	4730738.3	62042461.7	101	92	16.26238	28.65118
48	39	4453718.2	57311723.4	102	93	8.08068	12.38881
49	40	4192750.1	52858005.2	103	94	3.46997	4.30812
50	41	3943574.1	48665255.1	104	95	.83816	.83816
51	42	3707307.9	44721681.0	Difference of Age 96 years.			
52	43	3480000.3	41014373.1	96	0	8461.6349	25517.0841
53	44	3262923.9	37534372.8	97	1	5413.5268	17055.4492
54	45	3055776.9	34271448.9	98	2	3740.2235	11641.9224
55	46	2859574.5	31215672.0	99	3	2655.0419	7901.6989
56	47	2673153.0	28356097.5	100	4	2019.2100	5246.6570
57	48	2496683.9	25682944.5	101	5	1473.8049	3227.4470
58	49	2328933.8	23186260.6	102	6	999.01192	1753.64211
59	50	2165665.0	20857326.8	103	7	572.02389	754.63019
60	51	2005985.2	18691661.8	104	8	182.60630	182.60630
61	52	1846470.6	16685676.6				
62	53	1694038.7	14839206.0				

Difference of Age 96 years.

COMMUTATION TABLES FOR JOINT ANNUITIES.

Difference of Age 10 years.

AGES.		D _{xy}	N _{xy}	AGES.		D _{xy}	N _{xy}
(x)	(y)			(x)	(y)		
10	0	45796155.	653458274.	64	54	1440379.5	11954663.7
11	1	37269740.	607662119.	65	55	1313744.5	10514284.2
12	2	32947278.	570392379.	66	56	1195351.0	9200539.7
13	3	29617732.	537445101.	67	57	1084831.0	8005188.7
14	4	27387706.	507827369.	68	58	980689.56	6920357.73
15	5	25559513.	480439663.	69	59	881642.85	5939668.17
16	6	24105405.	454880150.	70	60	787094.45	5058025.32
17	7	22849860.	430774745.	71	61	697050.47	4270930.87
18	8	21731667.	407924885.	72	62	611162.60	3573880.40
19	9	20713415.	386193218.	73	63	529681.23	2962717.80
20	10	19771645.	365479803.	74	64	453745.45	2433036.57
21	11	18883006.	345708158.	75	65	383007.98	1979291.12
22	12	18030397.	326825152.	76	66	320955.30	1596283.14
23	13	17212336.	308794755.	77	67	266347.76	1275327.84
24	14	16427568.	291582419.	78	68	219498.47	1008980.08
25	15	15672391.	275154851.	79	69	180218.53	789481.61
26	16	14938599.	259482460.	80	70	145967.81	609263.08
27	17	14230974.	244543861.	81	71	117468.16	463295.27
28	18	13548595.	230312887.	82	72	92523.382	345827.115
29	19	12886212.	216764292.	83	73	71584.184	253303.733
30	20	12241648.	203878080.	84	74	54140.229	181719.549
31	21	11625518.	191636432.	85	75	40035.487	127579.320
32	22	11040528.	180010914.	86	76	28854.173	87543.833
33	23	10485263.	168970386.	87	77	20169.762	58689.660
34	24	9958226.7	158485122.7	88	78	13633.206	38519.898
35	25	9456229.8	148526896.0	89	79	9158.2639	24886.6917
36	26	8976598.0	139070666.2	90	80	6119.9769	15728.4278
37	27	8518293.6	130094068.2	91	81	3840.1037	9608.4509
38	28	8077656.9	121575774.6	92	82	2295.5518	5768.3472
39	29	7650218.0	113498117.7	93	83	1372.2376	3472.3954
40	30	7231945.5	105847899.7	94	84	833.91697	2100.55784
41	31	6826842.0	98615954.2	95	85	508.33271	1266.64087
42	32	6438731.4	91789112.2	96	86	310.54200	758.30816
43	33	6069470.8	85350380.8	97	87	189.38706	447.76616
44	34	5720627.8	79280910.0	98	88	111.54799	258.37910
45	35	5390098.0	73560282.2	99	89	66.06579	146.83111
46	36	5078076.5	68170184.2	100	90	40.97282	80.76532
47	37	4782654.3	63092107.7	101	91	22.76733	39.79249
48	38	4504013.3	58309453.4	102	92	11.22317	17.02517
49	39	4243145.7	53805440.1	103	93	4.68445	5.80200
50	40	3995535.8	49562294.4	104	94	1.11754	1.11754
51	41	3759090.1	45566758.6	Difference of Age 95 years.			
52	42	3530745.9	41807668.5	95	0	11423.207	34755.4001
53	43	3311208.1	38276922.6	96	1	7159.3893	23332.1931
54	44	3101675.0	34965714.5	97	2	4977.1688	16172.8038
55	45	2902557.2	31864039.5	98	3	3437.4143	11195.6350
56	46	2713355.2	28961482.3	99	4	2554.3006	7698.2207
57	47	2533684.1	26248127.1	100	5	1961.2132	5143.9201
58	48	2361846.0	23714443.0	101	6	1447.5683	3182.7069
59	49	2195709.4	21352597.0	102	7	986.74126	1735.13864
60	50	2033268.1	19156887.6	103	8	566.99243	748.39738
61	51	1873243.5	17123619.5	104	9	181.40495	181.40495
62	52	1720187.5	15250376.0				
63	53	1575524.8	13530188.5				

Difference of Age 95 years.

COMMUTATION TABLES FOR JOINT ANNUITIES.

Difference of Age 11 years.

AGES.		D_{xy}	N_{xy}	AGES.		D_{xy}	N_{xy}
(x)	(y)			(x)	(y)		
11	0	44048859.	625359114.	65	54	1336322.9	10835266.1
12	1	35835830.	581310255.	66	55	1217166.1	9498943.2
13	2	31673953.	545474425.	67	56	1105842.0	8281777.1
14	3	28467873.	513800472.	68	57	1001620.5	7175935.1
15	4	26315355.	485332599.	69	58	903513.42	6174314.59
16	5	24542306.	459017244.	70	59	809996.46	5270801.17
17	6	23134011.	434474938.	71	60	721202.75	4460804.71
18	7	21924512.	411340927.	72	61	633844.93	3739601.96
19	8	20850590.	389416415.	73	62	550265.54	3105757.03
20	9	19872646.	368565825.	74	63	471791.33	2555491.49
21	10	18968157.	348693179.	75	64	398871.47	2083700.16
22	11	18117731.	329725022.	76	65	334707.37	1684828.69
23	12	17298830.	311607291.	77	66	278170.48	1350121.32
24	13	16513142.	294308461.	78	67	229694.21	1071950.84
25	14	15759460.	277795319.	79	68	188997.49	842256.63
26	15	15031653.	262035859.	80	69	153506.33	653259.14
27	16	14327083.	247004206.	81	70	123865.19	499752.81
28	17	13642926.	232677123.	82	71	98308.792	375887.619
29	18	12976560.	219034197.	83	72	76817.680	277578.827
30	19	12328083.	206057637.	84	73	58727.885	200761.147
31	20	11708186.	193729554.	85	74	44003.182	142033.262
32	21	11117747.	182021368.	86	75	31901.478	98030.080
33	22	10559116.	170903621.	87	76	22485.054	66128.602
34	23	10028864.	160344505.	88	77	15274.136	43643.548
35	24	9523785.8	150315641.4	89	78	10276.572	28369.412
36	25	9042738.1	140791855.6	90	79	6941.9675	18092.8404
37	26	8581522.9	131749117.5	91	80	4372.3044	11150.8729
38	27	8140895.4	123167594.6	92	81	2650.1750	6778.5685
39	28	7717348.7	115026699.2	93	82	1596.9057	4128.3935
40	29	7303726.6	107309350.5	94	83	982.09882	2531.48778
41	30	6896516.2	100005623.9	95	84	604.28765	1549.38896
42	31	6505122.0	93109107.7	96	85	376.54275	945.10131
43	32	6131585.1	86603985.7	97	86	234.81437	568.56856
44	33	5778710.6	80472400.6	98	87	142.31985	333.74419
45	34	5445386.2	74693690.0	99	88	84.68102	191.42434
46	35	5130704.0	69248303.8	100	89	52.22592	106.74333
47	36	4833659.6	64117599.8	101	90	30.79010	54.51740
48	37	4553441.2	59283940.2	102	91	15.71244	23.72731
49	38	4291062.8	54730499.0	103	92	6.50619	8.01487
50	39	4043560.9	50439436.2	104	93	1.50868	1.50868
51	40	3808621.0	46395875.3	Difference of Age 94 years.			
52	41	3580062.0	42587254.3	94	0	15764.026	47589.1068
53	42	3359492.3	39007192.3	95	1	9665.1754	31825.0808
54	43	3147573.1	35647700.0	96	2	6582.3058	22159.9054
55	44	2946153.8	32500126.9	97	3	4654.0591	15577.5996
56	45	2754140.0	29553973.1	98	4	3364.7106	10923.5405
57	46	2571788.8	26799833.1	99	5	2480.9348	7558.8299
58	47	2396847.9	24228044.3	100	6	1926.2998	5077.8951
59	48	2226739.0	21831196.4	101	7	1429.7881	3151.5953
60	49	2061475.8	19604457.4	102	8	978.0620	1721.8072
61	50	1898721.0	17542981.6	103	9	563.2622	743.7452
62	51	1745129.4	15644260.6	104	10	180.4830	180.4830
63	52	1599844.3	13899131.2				
64	53	1464020.8	12299286.9				

Difference of Age 94 years.

COMMUTATION TABLES FOR JOINT ANNUITIES.

Difference of Age 12 years.

AGES.		D _{x,y}	N _{x,y}	AGES.		D _{x,y}	N _{x,y}
(x)	(y)			(x)	(y)		
12	0	42354131.	598276966.	66	54	1238084.7	9784251.5
13	1	34450870.	555922835.	67	55	1126023.6	8546166.8
14	2	30444265.	521471965.	68	56	1021019.8	7420143.2
15	3	27353229.	491027700.	69	57	922797.15	6399123.40
16	4	25268068.	463674471.	70	58	830089.73	5476326.25
17	5	23553306.	438406403.	71	59	742187.51	4646236.52
18	6	22197155.	414853097.	72	60	655807.18	3904049.01
19	7	21035617.	392655942.	73	61	570687.76	3248241.83
20	8	20004253.	371620325.	74	62	490125.93	2677554.07
21	9	19065053.	351616072.	75	63	414734.95	2187428.14
22	10	18199432.	332551019.	76	64	348570.33	1772693.19
23	11	17382621.	314351587.	77	65	290089.33	1424122.86
24	12	16596123.	296968966.	78	66	239889.95	1134033.53
25	13	15841553.	280372843.	79	67	197776.46	894143.58
26	14	15115162.	264531290.	80	68	160984.07	696367.12
27	15	14416327.	249416128.	81	69	130262.23	535383.05
28	16	13735064.	234999801.	82	70	103662.45	405120.82
29	17	13066909.	221264737.	83	71	81621.025	301458.371
30	18	12414518.	208197828.	84	72	63021.461	219837.346
31	19	11790855.	195783310.	85	73	47731.860	156815.885
32	20	11196805.	183992455.	86	74	35063.058	109084.025
33	21	10632968.	172795650.	87	75	24859.713	74020.967
34	22	10099502.	162162682.	88	76	17027.458	49161.254
35	23	9591341.8	152063180.0	89	77	11513.488	32133.796
36	24	9107339.9	142471838.2	90	78	7789.6453	20620.3076
37	25	8644752.0	133364498.3	91	79	4959.5604	12830.623
38	26	8201323.3	124719746.3	92	80	3017.4633	7871.1019
39	27	7777766.3	116518423.0	93	81	1843.6000	4853.6386
40	28	7367816.8	108740656.7	94	82	1142.8919	3010.0386
41	29	6964968.0	101372839.9	95	83	711.66579	1867.14669
42	30	6571512.8	94407871.9	96	84	447.62049	1155.48090
43	31	6194808.8	87836359.1	97	85	284.72042	707.86041
44	32	5837849.3	81641550.3	98	86	176.45739	423.13999
45	33	5500674.4	75803701.0	99	87	108.04130	246.68260
46	34	5183331.5	70303026.6	100	88	66.94151	138.64130
47	35	4883754.1	65119695.1	101	89	39.24653	71.69979
48	36	4602002.0	60235941.0	102	90	21.24921	32.45326
49	37	4338153.8	55633939.0	103	91	9.10866	11.20405
50	38	4089224.2	51295785.2	104	92	2.09539	2.09539
51	39	3854399.5	47206561.0	Difference of Age 93 years.			
52	40	3627233.9	43352161.5	93	0	22026.285	65619.1893
53	41	3406416.4	39724927.6	94	1	13337.942	43592.9043
54	42	3193471.1	36318511.2	95	2	8861.127	30254.9623
55	43	2989750.5	33125040.1	96	3	6154.9932	21368.8496
56	44	2795507.4	30135289.6	97	4	4477.4685	15213.8564
57	45	2610445.7	27339782.2	98	5	3268.0677	10736.3879
58	46	2432894.7	24729336.5	99	6	2436.7692	7468.3202
59	47	2259738.6	22296441.8	100	7	1902.6394	5031.5510
60	48	2090608.4	20036703.2	101	8	1417.2119	3128.9116
61	49	1925062.2	17946094.8	102	9	971.6274	1711.6977
62	50	1768864.5	16021032.6	103	10	560.3995	740.0723
63	51	1623041.3	14252168.1	104	11	179.6728	179.6728
64	52	1486619.0	12829126.8				
65	53	1358256.3	11142507.8				

Difference of Age 93 years.

COMMUTATION TABLES FOR JOINT ANNUITIES.

Difference of Age 11 years.

AGES.		D_{xy}	N_{xy}	AGES.		D_{xy}	N_{xy}
(x)	(y)			(x)	(y)		
11	0	44048859.	625359114.	65	54	1336322.9	10835266.1
12	1	35835830.	581310255.	66	55	1217166.1	9498943.2
13	2	31673953.	545474425.	67	56	1105842.0	8281777.1
14	3	28467873.	513800472.	68	57	1001620.5	7175935.1
15	4	26315355.	485332599.	69	58	903513.42	6174314.59
16	5	24542306.	459017244.	70	59	809996.46	5270801.17
17	6	23134011.	434474938.	71	60	721202.75	4460804.71
18	7	21924512.	411340927.	72	61	633844.93	3739601.96
19	8	20850590.	389416415.	73	62	550265.54	3105757.03
20	9	19872646.	368565825.	74	63	471791.33	2555491.49
21	10	18968157.	348693179.	75	64	398871.47	2083700.16
22	11	18117731.	329725022.	76	65	334707.37	1684828.69
23	12	17298830.	311607291.	77	66	278170.48	1350121.32
24	13	16513142.	294308461.	78	67	229694.21	1071950.84
25	14	15759460.	277795319.	79	68	188997.49	842256.63
26	15	15031653.	262035859.	80	69	153506.33	653259.14
27	16	14327083.	247004206.	81	70	123865.19	499752.81
28	17	13642926.	232677123.	82	71	98308.792	375887.619
29	18	12976560.	219034197.	83	72	76817.680	277578.827
30	19	12328083.	206057637.	84	73	58727.885	200761.147
31	20	11708186.	193729554.	85	74	44003.182	142033.262
32	21	11117747.	182021368.	86	75	31901.478	98030.080
33	22	10559116.	170903621.	87	76	22485.054	66128.602
34	23	10028864.	160344505.	88	77	15274.136	43643.548
35	24	9523785.8	150315641.4	89	78	10276.572	28369.412
36	25	9042738.1	140791855.6	90	79	6941.9675	18092.8404
37	26	8581522.9	131749117.5	91	80	4372.3044	11150.8729
38	27	8140895.4	123167594.6	92	81	2650.1750	6778.5685
39	28	7717348.7	115026699.2	93	82	1596.9057	4128.3935
40	29	7303726.6	107309350.5	94	83	982.09882	2531.48778
41	30	6896516.2	100005623.9	95	84	604.28765	1549.38896
42	31	6505122.0	93109107.7	96	85	376.54275	945.10131
43	32	6131585.1	86603985.7	97	86	234.81437	568.55856
44	33	5778710.6	80472400.6	98	87	142.31985	333.74419
45	34	5445386.2	74693690.0	99	88	84.68102	191.42434
46	35	5130704.0	69248303.8	100	89	52.22592	106.74333
47	36	4833659.6	64117599.8	101	90	30.79010	54.51740
48	37	4553441.2	59283940.2	102	91	15.71244	23.72731
49	38	4291062.8	54730499.0	103	92	6.50619	8.01487
50	39	4043560.9	50439436.2	104	93	1.50868	1.50868
51	40	3808621.0	46395875.3	Difference of Age 94 years.			
52	41	3580062.0	42587254.3	94	0	15764.026	47589.1068
53	42	3359492.3	39007192.3	95	1	9665.1754	31825.0808
54	43	3147573.1	35647700.0	96	2	6582.3058	22159.9054
55	44	2946153.8	32500126.9	97	3	4654.0591	15577.5996
56	45	2754140.0	29553973.1	98	4	3364.7106	10923.5405
57	46	2571788.8	26799833.1	99	5	2480.9348	7558.8299
58	47	2396847.9	24228044.3	100	6	1926.2998	5077.8951
59	48	2226739.0	21831196.4	101	7	1429.7881	3151.5953
60	49	2061475.8	19604457.4	102	8	978.0620	1721.8072
61	50	1898721.0	17542981.6	103	9	563.2622	743.7452
62	51	1745129.4	15644260.6	104	10	180.4830	180.4830
63	52	1599844.3	13899131.2				
64	53	1464020.8	12299286.9				

Difference of Age 94 years.

COMMUTATION TABLES FOR JOINT ANNUITIES.

Difference of Age 13 years.

AGES.		D _{x,y}	N _{x,y}	AGES.		D _{x,y}	N _{x,y}
(x)	(y)			(x)	(y)		
13	0	40717256.	572185270.	67	54	1145375.8	8798592.0
14	1	33113372.	531468014.	68	55	1039653.4	7653216.2
15	2	29252236.	498354642.	69	56	940669.88	6613562.83
16	3	26264637.	469102406.	70	57	847806.37	5672892.95
17	4	24249822.	442837769.	71	58	760598.67	4825086.58
18	5	22599470.	418587947.	72	59	674889.14	4064487.91
19	6	21297206.	395988477.	73	60	590461.67	3389598.77
20	7	20181769.	374691271.	74	61	508316.17	2799137.10
21	8	19191312.	354509502.	75	62	430852.25	2290820.93
22	9	18292401.	335318190.	76	63	362433.29	1859968.68
23	10	17461007.	317025789.	77	64	302104.29	1497535.39
24	11	16676510.	299564782.	78	65	250168.57	1195431.10
25	12	15921159.	282888272.	79	66	206555.42	945262.53
26	13	15193899.	266967113.	80	67	168461.80	738707.11
27	14	14496418.	251773214.	81	68	136607.68	570245.31
28	15	13820620.	237276796.	82	69	109016.12	433637.63
29	16	13155156.	223456176.	83	70	86065.912	324621.513
30	17	12500954.	210301020.	84	71	66962.141	238555.601
31	18	11873524.	197800066.	85	72	51221.520	171593.460
32	19	11275863.	185926542.	86	73	38034.181	120371.940
33	20	10708579.	174650679.	87	74	27323.423	82337.759
34	21	10170140.	163942100.	88	75	18825.738	55014.336
35	22	9658897.8	153771960.5	89	76	12835.125	36188.598
36	23	9171941.9	144113062.7	90	77	8727.2284	23353.4728
37	24	8706510.7	134941120.8	91	78	5565.1682	14626.2444
38	25	8261751.1	126234610.1	92	79	3422.7470	9061.0762
39	26	7835498.8	117972859.0	93	80	2099.1050	5638.3292
40	27	7425498.1	110137360.2	94	81	1319.4490	3539.2242
41	28	7026085.6	102711862.1	95	82	828.1825	2219.7752
42	29	6636738.7	95685776.5	96	83	527.15985	1391.59271
43	30	6258032.5	89049037.8	97	84	338.46539	864.43286
44	31	5898044.3	82791005.3	98	85	213.96059	525.96747
45	32	5556967.8	76892961.0	99	86	133.95661	312.00688
46	33	5235959.0	71335993.2	100	87	85.40814	178.05027
47	34	4933848.5	66100034.2	101	88	50.30495	92.64213
48	35	4649695.7	61166185.7	102	89	27.08525	42.33718
49	36	4384418.6	56516490.0	103	90	12.31838	15.25193
50	37	4134100.2	52132071.4	104	91	2.93355	2.93355
51	38	3897926.6	47997971.2	Difference of Age 92 years.			
52	39	3670832.2	44100044.6	92	0	31662.784	91755.518
53	40	3451300.3	40429212.4	93	1	18636.440	60092.734
54	41	3238076.3	36977912.1	94	2	12262.836	41456.294
55	42	3033347.2	33739835.8	95	3	8309.2407	29193.4576
56	43	2836874.9	30706488.6	96	4	5921.4521	20884.2169
57	44	2649654.9	27869613.7	97	5	4348.8644	14962.7648
58	45	2469463.9	25219958.8	98	6	3209.8897	10613.9004
59	46	2293723.4	22750494.9	99	7	2406.8389	7404.0107
60	47	2121590.7	20456771.5	100	8	1885.9040	4997.1718
61	48	1952266.9	18335180.8	101	9	1407.8881	3111.2678
62	49	1793404.1	16382913.9	102	10	966.6892	1703.3797
63	50	1645115.8	14589509.8	103	11	557.8838	736.6905
64	51	1508174.3	12944394.0	104	12	178.8067	178.8067
65	52	1379222.0	11436219.7				
66	53	1258405.7	10056997.7				

Difference of Age 92 years.

COMMUTATION TABLES FOR JOINT ANNUITIES.

Difference of Age 14 years.

AGES.		D _{xy}	N _{xy}	AGES.		D _{xy}	N _{xy}
(x)	(y)			(x)	(y)		
14	0	39136476.	547050866.	68	54	1057521.3	7875431.5
15	1	31816837.	507914390.	69	55	957837.1	6817910.2
16	2	28088069.	476097553.	70	56	864226.68	5860073.08
17	3	25206231.	448009484.	71	57	776832.16	4995846.40
18	4	23267779.	422803253.	72	58	691630.85	4219014.24
19	5	21683210.	399535474.	73	59	607642.27	3527383.39
20	6	20432740.	377852264.	74	60	525928.94	2919741.12
21	7	19361614.	357419524.	75	61	446842.65	2393812.18
22	8	18413543.	338057910.	76	62	376518.06	1946969.53
23	9	17550204.	319644367.	77	63	314119.26	1570451.47
24	10	16751712.	302094163.	78	64	260530.10	1256332.21
25	11	15998277.	285342451.	79	65	215405.75	995802.11
26	12	15270250.	269344174.	80	66	175939.54	780396.36
27	13	14571932.	254073924.	81	67	142953.12	604456.82
28	14	13897401.	239501992.	82	68	114326.61	461503.70
29	15	13237100.	225604591.	83	69	90510.798	347177.086
30	16	12585379.	212367491.	84	70	70608.740	256666.288
31	17	11956192.	199782112.	85	71	54424.360	186057.548
32	18	11354921.	187825920.	86	72	40814.847	131633.188
33	19	10784189.	176470999.	87	73	29638.715	90818.341
34	20	10242459.	165686810.	88	74	20691.454	61179.626
35	21	9726453.7	155444351.0	89	75	14190.649	40488.172
36	22	9236543.9	145717897.3	90	76	9729.0294	26297.5229
37	23	8768269.5	136481353.4	91	77	6235.0070	16568.4935
38	24	8320773.6	127713083.9	92	78	3840.6957	10333.4865
39	25	7893231.2	119392310.3	93	79	2381.0414	6492.7908
40	26	7480615.7	111499079.1	94	80	1502.3117	4111.7494
41	27	7081091.6	104018463.4	95	81	956.12242	2609.43775
42	28	6694976.2	96937371.8	96	82	613.46853	1653.31533
43	29	6320146.9	90242395.6	97	83	398.60858	1039.84680
44	30	5958239.1	83922248.7	98	84	254.34866	641.23822
45	31	5614266.5	77964009.6	99	85	162.42695	386.88956
46	32	5289543.4	72349743.1	100	86	105.89455	224.46261
47	33	4983943.0	67060199.7	101	87	64.18218	118.56806
48	34	4697389.3	62076256.7	102	88	34.71701	54.38588
49	35	4429857.3	57378867.4	103	89	15.70160	19.66887
50	36	4178188.8	52949010.1	104	90	3.96727	3.96727
51	37	3940703.2	48770821.3	Difference of Age 91 years.			
52	38	3712286.3	44830118.1	91	0	45879.375	129812.853
53	39	3492784.0	41117831.8	92	1	26789.882	83933.478
54	40	3280742.1	37625047.8	93	2	17134.247	57143.596
55	41	3075715.8	34344305.7	94	3	11466.752	40009.349
56	42	2878242.3	31268589.9	95	4	7993.9603	28542.5975
57	43	2688864.0	28390347.6	96	5	5751.3732	20548.6372
58	44	2506555.5	25701483.6	97	6	4271.4461	14797.2640
59	45	2328200.7	23194928.1	98	7	3170.4632	10525.8179
60	46	2153497.8	20866727.4	99	8	2385.6686	7355.3547
61	47	1981199.0	18713229.6	100	9	1873.4968	4969.6861
62	48	1818748.3	16732030.6	101	10	1400.7326	3096.1893
63	49	1667938.7	14913282.3	102	11	962.34957	1695.45675
64	50	1528686.6	13245343.6	103	12	555.19456	733.10718
65	51	1399220.1	11716657.0	104	13	177.91262	177.91262
66	52	1277830.2	10317436.9				
67	53	1164175.2	9039606.7				

Difference of Age 91 years.

COMMUTATION TABLES FOR JOINT ANNUITIES.

Difference of Age 15 years.

AGES.		$D_{x,y}$	$N_{x,y}$	AGES.		$D_{x,y}$	$N_{x,y}$
(x)	(y)			(x)	(y)		
15	0	37604109.	522840650.	69	54	974298.83	7012486.74
16	1	30550604.	485236541.	70	55	879998.82	6038187.91
17	2	26956182.	454685937.	71	56	791877.84	5158189.09
18	3	24185456.	427729755.	72	57	706392.36	4366311.25
19	4	22324423.	403544299.	73	58	622715.82	3659918.89
20	5	20803076.	381219876.	74	59	541231.84	3037203.07
21	6	19602386.	360416800.	75	60	462325.41	2495971.23
22	7	18576943.	340814414.	76	61	390491.92	2033645.82
23	8	17666430.	322237471.	77	62	326326.47	1643153.90
24	9	16837285.	304571041.	78	63	270891.62	1316827.43
25	10	16070420.	287733756.	79	64	224327.46	1045935.81
26	11	15344215.	271663336.	80	65	183478.07	821608.35
27	12	14645158.	256319121.	81	66	149298.57	638130.28
28	13	13969795.	241673963.	82	67	119637.09	488831.71
29	14	13310639.	227704168.	83	68	94919.84	369194.62
30	15	12663774.	214393529.	84	69	74255.338	274274.782
31	16	12036938.	201729755.	85	70	57388.181	200019.444
32	17	11433979.	189692817.	86	71	43366.966	142631.263
33	18	10859800.	178258838.	87	72	31805.592	99264.297
34	19	10314779.	167399038.	88	73	22444.776	67458.705
35	20	9795618.2	157084259.0	89	74	15597.006	45013.929
36	21	9301145.9	147288640.8	90	75	10756.518	29416.923
37	22	8830028.2	137987494.9	91	76	6950.7253	18660.4049
38	23	8379796.1	129157466.7	92	77	4302.9723	11709.6796
39	24	7949621.0	120777670.6	93	78	2671.7884	7406.7073
40	25	7535733.3	112828049.6	94	79	1704.0912	4734.9189
41	26	7133652.7	105292316.3	95	80	1088.6316	3030.8277
42	27	6747389.8	98158663.6	96	81	708.23884	1942.19610
43	28	6375606.3	91411273.8	97	82	463.87034	1233.95726
44	29	6017378.0	85035667.5	98	83	299.54483	770.08692
45	30	5671565.2	79018289.5	99	84	193.08732	470.54209
46	31	5344084.7	73346724.3	100	85	128.40075	277.45477
47	32	5034948.2	68002639.6	101	86	79.57723	149.05402
48	33	4745082.9	62967691.4	102	87	44.29412	69.47680
49	34	4475296.0	58222608.5	103	88	20.12580	25.18268
50	35	4221490.2	53747312.5	104	89	5.05688	5.05688
51	36	3982729.4	49525822.3	Difference of Age 90 years.			
52	37	3753025.6	45543092.9	90	0	64218.016	182811.031
53	38	3532227.4	41790067.3	91	1	38818.539	118593.015
54	39	3320175.7	38257839.9	92	2	24630.480	79774.476
55	40	3116242.3	34937664.2	93	3	16021.920	55143.996
56	41	2918444.5	31821421.9	94	4	11031.665	39122.076
57	42	2728073.2	28902977.4	95	5	7764.3538	28090.4108
58	43	2543647.0	26174904.2	96	6	5648.9874	20326.0570
59	44	2363170.5	23631257.2	97	7	4218.9807	14677.0696
60	45	2185867.3	21268086.7	98	8	3142.5762	10458.0889
61	46	2010994.7	19082219.4	99	9	2369.9734	7315.5127
62	47	1845701.7	17071224.7	100	10	1863.9749	4945.5393
63	48	1691509.8	15225523.0	101	11	1394.4445	3081.5644
64	49	1549894.2	13534013.2	102	12	957.71066	1687.11989
65	50	1418250.5	11984119.0	103	13	552.41858	729.40923
66	51	1296358.1	10565868.5	104	14	176.99065	176.99065
67	52	1182145.1	9269510.4				
68	53	1074878.6	8087365.3				

Difference of Age 90 years.

COMMUTATION TABLES FOR JOINT ANNUITIES.

Difference of Age 16 years.

AGES.		D _{x,y}	N _{x,y}	AGES.		D _{x,y}	N _{x,y}
(x)	(y)			(x)	(y)		
16	0	36107557.	499527945.	70	54	895122.79	6207596.15
17	1	29319483.	463420388.	71	55	806329.61	5312473.36
18	2	25864540.	434100905.	72	56	720073.76	4506143.75
19	3	23204895.	408236365.	73	57	636006.46	3786069.99
20	4	21418262.	385031470.	74	58	554657.97	3150063.53
21	5	19957672.	363613208.	75	59	475777.65	2595405.56
22	6	18807958.	343655536.	76	60	404022.18	2119627.91
23	7	17823201.	324847578.	77	61	338437.55	1715605.73
24	8	16948790.	307024377.	78	62	281418.92	1377168.18
25	9	16152513.	290075587.	79	63	233249.17	1095749.26
26	10	15413409.	273923074.	80	64	191077.39	862500.09
27	11	14716095.	258509665.	81	65	155695.61	671422.70
28	12	14039995.	243793570.	82	66	124947.58	515727.09
29	13	13379977.	229753575.	83	67	99328.881	390779.515
30	14	12734128.	216373598.	84	68	77872.529	291450.634
31	15	12111917.	203639470.	85	69	60352.002	213578.105
32	16	11511199.	191527553.	86	70	45728.628	153226.103
33	17	10935411.	180016354.	87	71	33794.368	107497.475
34	18	10387098.	169080943.	88	72	24085.707	73703.107
35	19	9864782.7	158693845.0	89	73	16918.643	49617.400
36	20	9367286.0	148829062.3	90	74	11822.537	32698.757
37	21	8891786.9	139461776.3	91	75	7684.7953	20876.2200
38	22	8438818.7	130569989.4	92	76	4796.9118	13191.4247
39	23	8006010.8	122131170.7	93	77	2993.3721	8394.5129
40	24	7589569.2	114125159.9	94	78	1912.1763	5401.1408
41	25	7186213.9	106535590.7	95	79	1234.8487	3488.9645
42	26	6797474.0	99349376.8	96	80	806.39380	2254.11582
43	27	6425519.7	92551902.8	97	81	535.53031	1447.72202
44	28	6070180.5	86126383.1	98	82	348.58748	912.19171
45	29	5727858.6	80056202.6	99	83	227.39773	563.60423
46	30	5398625.9	74328344.0	100	84	152.63819	336.20650
47	31	5086864.3	68929718.1	101	85	96.49010	183.56831
48	32	4793643.7	63842853.8	102	86	54.91872	87.07821
49	33	4520734.7	59049210.1	103	87	25.67775	32.15949
50	34	4264791.6	54528475.4	104	88	6.48174	6.48174
51	35	4024005.1	50263683.8	Difference of Age 89 years.			
52	36	3793050.3	46239678.7	89	0	84720.295	251694.291
53	37	3570990.8	42446628.4	90	1	54334.863	166973.996
54	38	3357669.9	38875637.6	91	2	35689.566	112639.133
55	39	3153698.7	35517967.7	92	3	23031.509	76949.567
56	40	2956898.8	32364269.0	93	4	15413.994	53918.058
57	41	2766177.8	29407370.2	94	5	10714.808	38504.064
58	42	2580738.6	26641192.4	95	6	7626.1329	27789.2564
59	43	2398140.2	24060453.8	96	7	5579.6020	20163.1235
60	44	2218699.2	21662313.6	97	8	4181.8711	14583.5215
61	45	2041222.3	19443614.4	98	9	3121.9014	10401.6504
62	46	1873459.6	17402392.1	99	10	2357.9283	7279.7490
63	47	1716577.5	15528932.5	100	11	1855.6072	4921.8207
64	48	1571797.2	13812355.0	101	12	1387.7227	3066.2135
65	49	1437926.1	12240557.8	102	13	952.92211	1678.49077
66	50	1313989.5	10802631.7	103	14	549.55586	725.56866
67	51	1199285.6	9488642.2	104	15	176.01280	176.01280
68	52	1091470.2	8289356.6				
69	53	990290.21	7197886.36				

Difference of Age 89 years.

COMMUTATION TABLES FOR JOINT ANNUITIES.

Difference of Age 17 years.

AGES.		$D_{x,y}$	$N_{x,y}$	AGES.		$D_{x,y}$	$N_{x,y}$
(x)	(y)			(x)	(y)		
17	0	34652503.	477100005.	71	54	820187.48	5459068.44
18	1	28132135.	442447502.	72	55	733215.11	4638880.96
19	2	24815903.	414315367.	73	56	648324.64	3905665.85
20	3	22262995.	389499464.	74	57	566496.07	3257341.21
21	4	20547858.	367236469.	75	58	487580.08	2690845.14
22	5	19148845.	346688611.	76	59	415777.97	2203265.06
23	6	18044842.	327539766.	77	60	350164.16	1787487.09
24	7	17099193.	309494924.	78	61	291863.34	1437322.93
25	8	16259484.	292395731.	79	62	242313.63	1145459.59
26	9	15492146.	276136247.	80	63	198676.71	903145.96
27	10	14782456.	260644101.	81	64	162144.23	704469.25
28	11	14108001.	245861645.	82	65	130301.24	542325.02
29	12	13447213.	231753644.	83	66	103737.92	412023.78
30	13	12800462.	218306431.	84	67	81489.72	308285.86
31	14	12179205.	205505969.	85	68	63291.921	226796.140
32	15	11582902.	193326764.	86	69	48090.288	163504.219
33	16	11009263.	181743862.	87	70	35634.730	115413.931
34	17	10459418.	170734599.	88	71	25591.765	79779.201
35	18	9933947.2	160275181.1	89	72	18155.559	54187.436
36	19	9433426.1	150341233.9	90	73	12824.338	36031.877
37	20	8955016.1	140907807.8	91	74	8446.3929	23207.5387
38	21	8497841.2	131952791.7	92	75	5303.5163	14761.1458
39	22	8062400.7	123454950.5	93	76	3336.9821	9457.6295
40	23	7643405.0	115392549.8	94	77	2142.3311	6120.6474
41	24	7237552.8	107749144.8	95	78	1385.6350	3978.3163
42	25	6847558.1	100511592.0	96	79	914.70273	2592.68128
43	26	6473214.7	93664033.9	97	80	609.74956	1677.97855
44	27	6117702.9	87190819.2	98	81	402.43824	1068.22899
45	28	5778120.6	81073116.3	99	82	264.62818	665.79075
46	29	5452210.3	75294995.7	100	83	179.76105	401.16257
47	30	5138780.4	69842785.4	101	84	114.70396	221.40152
48	31	4843071.7	64704005.0	102	85	66.59082	106.69756
49	32	4566999.5	59860933.3	103	86	31.83694	40.10675
50	33	4308093.0	55293933.8	104	87	8.26981	8.26981
51	34	4065280.8	50985840.8	Difference of Age 88 years.			
52	35	3832360.2	46920560.0	88	0	112392.47	342622.707
53	36	3609074.1	43088199.8	89	1	71681.842	230230.237
54	37	3394517.6	39479125.7	90	2	49955.195	158548.395
55	38	3189312.8	36084608.1	91	3	33372.657	108593.200
56	39	2992439.8	32895295.3	92	4	22157.616	75220.543
57	40	2802625.8	29902855.5	93	5	14971.266	53062.927
58	41	2616785.4	27100229.7	94	6	10524.064	38091.661
59	42	2433110.1	24483444.3	95	7	7532.4627	27567.5973
60	43	2251531.2	22050334.2	96	8	5530.5246	20035.1346
61	44	2071881.6	19798803.0	97	9	4154.3588	14504.6100
62	45	1901619.8	17726921.4	98	10	3106.0347	10350.2512
63	46	1742393.5	15825301.6	99	11	2347.3432	7244.2165
64	47	1595090.8	14082908.1	100	12	1846.6625	4896.8733
65	48	1458246.7	12487817.3	101	13	1380.7841	3050.2108
66	49	1332218.6	11029570.6	102	14	947.98391	1669.42675
67	50	1215596.8	9697352.0	103	15	546.51964	721.44284
68	51	1107296.0	8481755.2	104	16	174.92320	174.92320
69	52	1005576.1	7374459.2				
70	53	909814.64	6368883.08				

Difference of Age 88 years.

COMMUTATION TABLES FOR JOINT ANNUITIES.

Difference of Age 18 years.

AGES.		D _{x,y}	N _{x,y}	AGES.		D _{x,y}	N _{x,y}
(x)	(y)			(x)	(y)		
18	0	33249184.	455539736.	72	54	745816.40	4764886.85
19	1	26991561.	422290552.	73	55	660156.56	4019070.45
20	2	23808611.	395298991.	74	56	577467.96	3358913.89
21	3	21358262.	371490380.	75	57	497986.52	2781445.93
22	4	19715112.	350132118.	76	58	426092.02	2283459.41
23	5	18371898.	330417006.	77	59	360352.85	1857367.39
24	6	17311831.	312045108.	78	60	301976.18	1497014.54
25	7	16403769.	294733277.	79	61	251306.71	1195038.36
26	8	15594743.	278329508.	80	62	206397.63	943731.65
27	9	14857970.	262734765.	81	63	168592.86	737334.02
28	10	14171620.	247876795.	82	64	135698.08	568741.16
29	11	13512348.	233705175.	83	65	108182.81	433043.08
30	12	12864786.	220192827.	84	66	85106.911	324860.266
31	13	12242649.	207328041.	85	67	66231.841	239753.355
32	14	11647252.	195085392.	86	68	50432.904	173521.514
33	15	11077840.	183438140.	87	69	37475.090	123088.610
34	16	10530055.	172360300.	88	70	26985.432	85613.520
35	17	10003112.	161830245.	89	71	19290.811	58628.088
36	18	9499566.3	151827132.9	90	72	13761.921	39337.277
37	19	9018245.3	142327566.6	91	73	9162.1112	25575.3559
38	20	8558269.1	133309321.3	92	74	5829.1185	16413.2447
39	21	8118790.5	124751052.2	93	75	3689.4027	10584.1262
40	22	7697240.8	116632261.7	94	76	2388.2499	6894.7235
41	23	7288891.6	108935020.9	95	77	1552.4138	4506.4736
42	24	6896477.6	101646129.3	96	78	1026.3963	2954.0598
43	25	6520909.8	94749651.7	97	79	691.64667	1927.66353
44	26	6163113.0	88228741.9	98	80	458.21223	1236.01686
45	27	5823356.4	82065628.9	99	81	305.50867	777.80463
46	28	5500053.5	76242272.5	100	82	209.19223	472.29596
47	29	5189785.6	70742219.0	101	83	135.08614	263.10373
48	30	4892499.6	65552433.4	102	84	79.16077	128.01759
49	31	4614090.5	60659933.8	103	85	38.60337	48.85682
50	32	4352181.6	56045843.3	104	86	10.25344	10.25344
51	33	4106556.5	51693661.7	Difference of Age 87 years.			
52	34	3871670.1	47587105.2				
53	35	3646477.3	43715435.1	87	0	148416.20	462247.101
54	36	3430718.9	40068957.8	88	1	95095.269	313830.901
55	37	3224313.0	36638238.9	89	2	65903.917	218735.632
56	38	3026232.9	33413925.9	90	3	46712.185	152831.715
57	39	2836312.5	30387693.0	91	4	32106.387	106119.530
58	40	2651264.9	27551380.5	92	5	21521.194	74013.143
59	41	2467094.8	24900115.6	93	6	14704.748	52491.949
60	42	2284363.1	22433020.8	94	7	10394.799	37787.201
61	43	2102541.0	20148657.7	95	8	7466.208	27392.402
62	44	1930182.3	18046116.7	96	9	5494.1395	19926.1938
63	45	1768583.7	16115934.4	97	10	4133.2447	14432.0543
64	46	1619079.7	14347350.7	98	11	3092.0912	10298.8096
65	47	1479857.5	12728271.0	99	12	2336.0280	7206.7184
66	48	1351045.4	11248413.5	100	13	1837.4291	4870.6904
67	49	1232460.9	9897368.1	101	14	1373.6287	3033.2613
68	50	1122356.1	8664907.2	102	15	942.74643	1659.63265
69	51	1020156.5	7542551.1	103	16	543.13643	716.88622
70	52	923858.32	6522394.56	104	17	173.74979	173.74979
71	53	833649.39	5598536.24				

Difference of Age 87 years.

COMMUTATION TABLES FOR JOINT ANNUITIES.

Difference of Age 19 years.

AGES.		D _{x,y}	N _{x,y}	AGES.		D _{x,y}	N _{x,y}
(x)	(y)			(x)	(y)		
19	0	31901148.	434819707.	73	54	671502.25	4126625.85
20	1	25895958.	402918559.	74	55	588006.75	3455123.60
21	2	22841067.	377022601.	75	56	507631.52	2867116.85
22	3	20492673.	354181534.	76	57	435186.11	2359485.33
23	4	18915189.	333688861.	77	58	369291.98	1924299.22
24	5	17625601.	314773672.	78	59	310762.75	1555007.24
25	6	16607759.	297148071.	79	60	260014.30	1244244.49
26	7	15733130.	280540312.	80	61	214057.74	984230.19
27	8	14956367.	264807182.	81	62	175144.66	770172.45
28	9	14244013.	249850815.	82	63	141094.92	595027.79
29	10	13573280.	235606802.	83	64	112663.54	453932.87
30	11	12927100.	222033522.	84	65	88753.51	341269.33
31	12	12304170.	209106422.	85	66	69171.759	252515.816
32	13	11707924.	196802252.	86	67	52775.521	183344.057
33	14	11139383.	185094328.	87	68	39300.610	130568.536
34	15	10595647.	173954945.	88	69	28379.098	91267.926
35	16	10070668.	163359298.	89	70	20341.343	62888.828
36	17	9565706.3	153288630.5	90	71	14622.442	42547.485
37	18	9081474.5	143722924.2	91	72	9831.950	27925.043
38	19	8618697.0	134641449.7	92	73	6323.058	18093.093
39	20	8176522.9	126022752.7	93	74	4055.039	11770.035
40	21	7751076.6	117846229.8	94	75	2640.4744	7714.9965
41	22	7340230.4	110095153.2	95	76	1730.6158	5074.5221
42	23	6945397.0	102754922.8	96	77	1149.9362	3343.9063
43	24	6567495.6	95809525.8	97	78	776.10306	2193.97008
44	25	6208523.3	89242030.2	98	79	519.75596	1417.86702
45	26	5866581.8	83033506.9	99	80	347.84917	898.11106
46	27	5543112.3	77166925.1	100	81	241.50882	550.26189
47	28	5235326.0	71623812.8	101	82	157.20297	308.75307
48	29	4941060.4	66388486.8	102	83	93.22715	151.55010
49	30	4661181.5	61447426.4	103	84	45.89030	58.32295
50	31	4397057.6	56786244.9	104	85	12.43265	12.43265
51	32	4148582.6	52389187.3	Difference of Age 86 years.			
52	33	3910980.1	48240604.7	86	0	190456.59	614419.164
53	34	3683880.6	44329624.6	87	1	125574.95	423962.574
54	35	3466273.7	40645744.0	88	2	87430.102	298387.624
55	36	3258699.1	37179470.3	89	3	61625.543	210957.522
56	37	3059443.4	33920771.2	90	4	44939.767	149331.979
57	38	2868342.5	30861327.8	91	5	31184.211	104392.212
58	39	2683132.3	27992985.3	92	6	21138.075	73208.001
59	40	2499601.9	25309853.0	93	7	14524.132	52069.926
60	41	2316270.2	22810251.1	94	8	10303.367	37545.794
61	42	2133200.3	20493980.9	95	9	7417.0884	27242.4270
62	43	1958744.8	18360780.6	96	10	5466.2161	19825.3386
63	44	1795148.0	16402035.8	97	11	4114.6899	14359.1225
64	45	1643416.3	14606887.8	98	12	3077.1860	10244.4326
65	46	1502113.4	12963471.5	99	13	2324.3479	7167.2466
66	47	1371067.5	11461358.1	100	14	1827.9073	4842.8987
67	48	1249877.9	10090290.6	101	15	1366.0396	3014.9914
68	49	1137926.6	8840412.7	102	16	936.91038	1648.95176
69	50	1034031.4	7702486.1	103	17	539.49296	712.04138
70	51	937253.83	6668454.74	104	18	172.54842	172.54842
71	52	846517.41	5731200.91				
72	53	758057.65	4884683.50				

Difference of Age 86 years.

COMMUTATION TABLES FOR JOINT ANNUITIES.

Difference of Age 20 years.

AGES.		D _{x,y}	N _{x,y}	AGES.		D _{x,y}	N _{x,y}
(x)	(y)			(x)	(y)		
20	0	30606262.	414908048.	74	54	598112.44	3546281.20
21	1	24843587.	384301786.	75	55	516895.79	2948168.76
22	2	21915384.	359458199.	76	56	443614.80	2431272.97
23	3	19661202.	337542815.	77	57	377173.80	1987658.17
24	4	18146823.	317881613.	78	58	318471.72	1610484.37
25	5	16908768.	299734790.	79	59	267579.91	1292012.65
26	6	15928780.	282826022.	80	60	221474.68	1024432.74
27	7	15089089.	266897242.	81	61	181644.88	802958.06
28	8	14338345.	251808153.	82	62	146578.11	621313.18
29	9	13642618.	237469808.	83	63	117144.27	474735.07
30	10	12985393.	223827190.	84	64	92429.516	357590.801
31	11	12363768.	210841797.	85	65	72135.581	265161.285
32	12	11766758.	198478029.	86	66	55118.137	193025.704
33	13	11197410.	186711271.	87	67	41126.129	137907.567
34	14	10654512.	175513861.	88	68	29761.526	96781.438
35	15	10133398.	164859349.	89	69	21391.874	67019.912
36	16	9630308.2	154725951.4	90	70	15418.746	45628.038
37	17	9144703.7	145095643.2	91	71	10446.734	30209.292
38	18	8679124.8	135950939.5	92	72	6785.3345	19762.5578
39	19	8234255.3	127271814.7	93	73	4398.6491	12977.2233
40	20	7806194.3	119037559.4	94	74	2902.1572	8578.5742
41	21	7391569.2	111231365.1	95	75	1913.3871	5676.4170
42	22	6994316.5	103839795.9	96	76	1281.9377	3763.0299
43	23	6614081.5	96845479.4	97	77	869.51696	2481.09217
44	24	6252877.4	90231397.9	98	78	583.22291	1611.57521
45	25	5909807.2	83978520.5	99	79	394.56973	1028.35230
46	26	5584257.5	78068713.3	100	80	274.97958	633.78257
47	27	5276312.4	72484455.8	101	81	181.48812	358.80299
48	28	4984418.3	67208143.4	102	82	108.49066	177.31487
49	29	4707446.3	62223725.1	103	83	54.04472	68.82421
50	30	4441933.6	57516278.8	104	84	14.77949	14.77949
51	31	4191359.3	53074345.2	Difference of Age 85 years.			
52	32	3951004.7	48882985.9	85	0	239017.83	803549.27
53	33	3721283.8	44931981.2	86	1	161145.32	564531.44
54	34	3501828.6	41210697.4	87	2	115452.96	403386.12
55	35	3292471.2	37708868.8	88	3	81754.282	287933.156
56	36	3092071.3	34416397.6	89	4	59287.262	206178.874
57	37	2899820.3	31324326.3	90	5	43648.985	146891.612
58	38	2713432.5	28424506.0	91	6	30629.071	103242.627
59	39	2529646.4	25711073.5	92	7	20878.440	72613.556
60	40	2346790.0	23181427.1	93	8	14396.380	51735.116
61	41	2162996.0	20834637.1	94	9	10235.582	37338.736
62	42	1987307.4	18671641.1	95	10	7379.3917	27103.1540
63	43	1821712.3	16684333.7	96	11	5441.6774	19723.7623
64	44	1668100.6	14862621.4	97	12	4094.8554	14282.0849
65	45	1524691.9	13194520.8	98	13	3061.8001	10187.2295
66	46	1391687.3	11669828.9	99	14	2312.3027	7125.4294
67	47	1268400.8	10278141.6	100	15	1817.8084	4813.1267
68	48	1154007.7	9009740.8	101	16	1357.5831	2995.3183
69	49	1048376.6	7855733.1	102	17	930.6254	1637.7352
70	50	950001.18	6807356.51	103	18	535.7627	707.1098
71	51	858791.52	5857355.33	104	19	171.3471	171.3471
72	52	769758.85	4998563.81				
73	53	682523.76	4228804.96				

Difference of Age 85 years.

COMMUTATION TABLES FOR JOINT ANNUITIES.

Difference of Age 21 years.

AGES.		$D_{x,y}$	$N_{x,y}$	AGES.		$D_{x,y}$	$N_{x,y}$
(x)	(y)			(x)	(y)		
21	0	29362472.	395774082.	75	54	525779.35	3024884.74
22	1	23836748.	366411610.	76	55	451710.77	2499105.39
23	2	21026187.	342574862.	77	56	384478.90	2047394.62
24	3	18862531.	321548675.	78	57	325268.88	1662915.72
25	4	17408792.	302686144.	79	58	274217.66	1337646.84
26	5	16217483.	285277352.	80	59	227918.91	1063429.18
27	6	15276730.	269059869.	81	60	187938.73	835510.27
28	7	14465582.	253783139.	82	61	152018.12	647571.54
29	8	13732966.	239317557.	83	62	121696.70	495553.42
30	9	13051727.	225584591.	84	63	96105.533	373856.721
31	10	12419521.	212532864.	85	64	75123.303	277751.188
32	11	11823753.	200113343.	86	65	57479.799	202627.885
33	12	11253679.	188289590.	87	66	42951.648	145148.086
34	13	10710013.	177035911.	88	67	31143.953	102196.438
35	14	10189695.	166325898.	89	68	22433.934	71052.485
36	15	9690295.9	156136202.9	90	69	16215.049	48618.551
37	16	9206462.4	146445907.0	91	70	11015.638	32403.502
38	17	8739552.6	137239444.6	92	71	7209.6159	21387.8643
39	18	8291987.8	128499892.0	93	72	4720.2328	14178.2484
40	19	7861311.9	120207904.2	94	73	3148.0759	9458.0156
41	20	7444130.4	112346592.3	95	74	2103.0124	6309.9397
42	21	7043236.0	104902461.9	96	75	1417.3238	4206.9273
43	22	6660667.3	97859225.9	97	76	969.32906	2789.60346
44	23	6297231.6	91198558.6	98	77	653.42123	1820.27440
45	24	5952027.2	84901327.0	99	78	442.75031	1166.85317
46	25	5625402.6	78949299.8	100	79	311.91283	724.10286
47	26	5315477.2	73323897.2	101	80	206.64059	412.19003
48	27	5023440.3	68008420.0	102	81	125.25060	205.54944
49	28	4748754.2	62984979.7	103	82	62.89313	80.29884
50	29	4486022.2	58236225.5	104	83	17.40571	17.40571
51	30	4234135.9	53750203.3	Difference of Age 84 years.			
52	31	3991744.1	49516067.4				
53	32	3759367.1	45524323.3	84	0	294080.55	1033932.08
54	33	3537383.4	41764956.2	85	1	202232.99	739851.53
55	34	3326243.3	38227572.8	86	2	148156.18	537618.54
56	35	3124116.5	34901329.5	87	3	107957.94	389462.36
57	36	2930745.8	31777213.0	88	4	78652.25	281504.42
58	37	2743210.3	28846467.2	89	5	57584.384	202852.168
59	38	2558213.3	26103256.9	90	6	42871.947	145267.784
60	39	2374997.7	23545043.6	91	7	30252.860	102395.837
61	40	2191496.3	21170045.9	92	8	20694.796	72142.977
62	41	2015065.3	18978549.6	93	9	14301.667	51448.181
63	42	1848276.6	16963484.3	94	10	10183.561	37146.514
64	43	1692784.9	15115207.7	95	11	7346.2644	26962.9533
65	44	1547592.9	13422422.8	96	12	5415.4463	19616.6889
66	45	1412606.0	11874829.9	97	13	4074.3811	14201.2426
67	46	1287476.5	10462223.9	98	14	3045.9334	10126.8615
68	47	1171109.8	9174747.4	99	15	2299.5276	7080.9281
69	48	1063192.1	8003637.6	100	16	1806.5553	4781.4005
70	49	963180.63	6940445.52	101	17	1348.4762	2974.8452
71	50	870471.72	5977264.89	102	18	924.19078	1626.36902
72	51	780919.99	5106793.17	103	19	532.03253	702.17824
73	52	693059.04	4325873.18	104	20	170.14571	170.14571
74	53	607929.40	3632814.14				

Difference of Age 84 years.

COMMUTATION TABLES FOR JOINT ANNUITIES.

Difference of Age 22 years.

AGES.		D_{xy}	N_{xy}	AGES.		D_{xy}	N_{xy}
(x)	(y)			(x)	(y)		
22	0	28172495.	377388574.	76	54	459474.03	2563233.98
23	1	22869594.	349216079.	77	55	391495.64	2103759.95
24	2	20172069.	326346485.	78	56	331568.69	1712264.31
25	3	18095392.	306174416.	79	57	280070.30	1380695.62
26	4	16697064.	288079024.	80	58	233572.81	1100625.32
27	5	15553615.	271381960.	81	59	193407.17	867052.51
28	6	14645470.	255828345.	82	60	157285.43	673645.34
29	7	13854831.	241182875.	83	61	126213.28	516359.91
30	8	13138163.	227328044.	84	62	99840.346	390146.626
31	9	12482965.	214189881.	85	63	78111.027	290306.280
32	10	11877071.	201706916.	86	64	59860.506	212195.253
33	11	11308189.	189829845.	87	65	44792.009	152334.747
34	12	10763832.	178521656.	88	66	32526.381	107542.738
35	13	10242775.	167757824.	89	67	23475.994	75016.357
36	14	9744130.9	157515048.9	90	68	17004.931	51540.363
37	15	9263809.8	147770918.0	91	69	11584.542	34535.432
38	16	8798575.1	138507108.2	92	70	7602.2345	22950.8896
39	17	8349720.1	129708533.1	93	71	5015.3851	15348.6551
40	18	7916429.5	121358813.0	94	72	3378.2308	10333.2700
41	19	7496691.6	113442383.5	95	73	2281.2144	6955.0392
42	20	7093320.2	105945691.9	96	74	1557.7870	4673.8248
43	21	6707253.2	98852371.7	97	75	1071.7004	3116.0378
44	22	6341585.7	92145118.5	98	76	728.42763	2044.33744
45	23	5994247.3	85803532.8	99	77	496.04095	1315.90981
46	24	5665590.9	79809285.5	100	78	350.00024	819.86886
47	25	5354641.9	74143694.6	101	79	234.39504	469.86862
48	26	5060728.1	68789052.7	102	80	142.60910	235.47358
49	27	4785931.3	63728324.6	103	81	72.60904	92.86448
50	28	4525387.1	58942393.3	104	82	20.25544	20.25544
51	29	4276162.0	54417006.2	Difference of Age 83 years.			
52	30	4032483.5	50140844.2	83	0	358458.61	1312637.41
53	31	3798130.5	46108360.7	84	1	248821.55	954178.80
54	32	3573584.7	42310230.2	85	2	185931.97	705357.25
55	33	3360015.4	38736645.5	86	3	138538.12	519425.28
56	34	3156161.7	35376630.1	87	4	103861.66	380887.16
57	35	2961119.1	32220468.4	88	5	76393.162	277025.499
58	36	2772465.6	29259349.3	89	6	56559.269	200632.337
59	37	2586287.6	26486883.7	90	7	42345.360	144073.068
60	38	2401818.2	23900596.1	91	8	29986.759	101727.708
61	39	2217837.4	21498777.9	92	9	20558.646	71740.949
62	40	2041616.4	19280940.5	93	10	14228.980	51182.303
63	41	1874092.6	17239324.1	94	11	10137.845	36953.323
64	42	1717469.1	15365231.5	95	12	7310.8525	26815.4778
65	43	1570494.0	13647762.4	96	13	5388.3691	19504.6253
66	44	1433823.5	12077268.4	97	14	4053.2670	14116.2562
67	45	1306828.8	10643444.9	98	15	3029.1050	10062.9892
68	46	1188722.3	9326616.1	99	16	2285.2924	7033.8842
69	47	1078948.3	8147893.8	100	17	1794.4365	4748.5918
70	48	976792.2	7068945.5	101	18	1339.1525	2954.1553
71	49	882547.85	6092153.32	102	19	917.75617	1615.00284
72	50	791541.08	5209605.47	103	20	528.30232	697.24667
73	51	703108.07	4418064.39	104	21	168.94435	168.94435
74	52	617313.25	3714956.32				
75	53	534409.09	3097643.07				

Difference of Age 83 years.

COMMUTATION TABLES FOR JOINT ANNUITIES.

Difference of Age 23 years.

AGES.		$D_{x,y}$	$N_{x,y}$	AGES.		$D_{x,y}$	$N_{x,y}$
(x)	(y)			(x')	(y')		
23	0	27029422.	359717792.	77	54	398224.02	2156982.21
24	1	21940593.	332688370.	78	55	337619.82	1758758.19
25	2	19351671.	310747777.	79	56	285494.70	1421138.37
26	3	17355594.	291396106.	80	57	238557.96	1135643.67
27	4	16013565.	274040512.	81	58	198204.95	897085.71
28	5	14910913.	258026947.	82	59	161861.95	698880.76
29	6	14027124.	243116034.	83	60	130586.47	537018.81
30	7	13254750.	229088910.	84	61	103545.76	406432.34
31	8	12565633.	215834160.	85	62	81146.553	302886.577
32	9	11937743.	203268527.	86	63	62241.214	221740.024
33	10	11359182.	191330784.	87	64	46647.212	159498.810
34	11	10815970.	179971602.	88	65	33920.047	112851.598
35	12	10294246.	169155632.	89	66	24518.053	78931.551
36	13	9794889.5	158861386.3	90	67	17794.812	54413.498
37	14	9315275.4	149066496.8	91	68	12148.858	36618.686
38	15	8853381.8	139751221.4	92	69	7994.853	24469.828
39	16	8406110.0	130897839.6	93	70	5288.511	16474.975
40	17	7971547.2	122491729.6	94	71	3589.4687	11186.4641
41	18	7549252.7	114520182.4	95	72	2447.9933	7596.9954
42	19	7143404.4	106970929.7	96	73	1689.7885	5149.0021
43	20	6754948.2	99827525.3	97	74	1177.9108	3459.2136
44	21	6385939.8	93072577.1	98	75	805.35728	2281.30279
45	22	6036467.4	86686637.3	99	76	552.98163	1475.94551
46	23	5705779.2	80650169.9	100	77	392.12723	922.96388
47	24	5392895.9	74944390.7	101	78	263.01684	530.83665
48	25	5098015.8	69551494.8	102	79	161.76331	267.81981
49	26	4821456.0	64453479.0	103	80	82.67194	106.05650
50	27	4560815.5	59632023.0	104	81	23.38456	23.38456
51	28	4313685.4	55071207.5	Difference of Age 82 years.			
52	29	4072508.1	50757522.1				
53	30	3836893.9	46685014.0	82	0	431747.00	1645855.51
54	31	3610432.5	42848120.1	83	1	303291.83	1214108.51
55	32	3394401.5	39237687.6	84	2	228765.26	910816.68
56	33	3188206.9	35843286.1	85	3	173861.57	682051.42
57	34	2991492.4	32655079.2	86	4	133281.52	508189.85
58	35	2801198.5	29663586.8	87	5	100878.49	374908.33
59	36	2613869.4	26862388.3	88	6	75033.212	274029.841
60	37	2428176.2	24248518.9	89	7	55864.562	198996.629
61	38	2242883.1	21820342.7	90	8	41972.895	143132.067
62	39	2066156.0	19577459.6	91	9	29789.478	101159.172
63	40	1898786.2	17511303.6	92	10	20454.158	71369.694
64	41	1741458.1	15612517.4	93	11	14165.104	50915.536
65	42	1593395.0	13871059.3	94	12	10088.977	36750.432
66	43	1455040.9	12277664.3	95	13	7274.2982	26661.4554
67	44	1326457.5	10822623.4	96	14	5360.4457	19387.1572
68	45	1206590.2	9496165.9	97	15	4030.8733	14026.7115
69	46	1095174.9	8289575.7	98	16	3010.3534	9995.8382
70	47	991267.99	7194400.79	99	17	2269.9622	6985.4848
71	48	895019.93	6203132.80	100	18	1782.0293	4715.5226
72	49	802522.21	5308112.87	101	19	1329.8287	2933.4933
73	50	712670.86	4505590.66	102	20	911.32155	1603.66459
74	51	626264.01	3792919.80	103	21	524.57211	692.34304
75	52	542658.10	3166655.79	104	22	167.77093	167.77093
76	53	467015.48	2623997.69				

Difference of Age 82 years.

COMMUTATION TABLES FOR JOINT ANNUITIES.

Difference of Age 24 years.

AGES.		D _{x,y}	N _{x,y}	AGES.		D _{x,y}	N _{x,y}
(x)	(y)			(x)	(y)		
24	0	25931442.	342733822.	78	54	343422.27	1802603.01
25	1	21048270.	316802380.	79	55	290704.98	1459180.74
26	2	18560512.	295754110.	80	56	243178.35	1168475.76
27	3	16645137.	277193598.	81	57	202435.24	925297.41
28	4	15351857.	260548461.	82	58	165877.20	722862.17
29	5	14281360.	245196604.	83	59	134386.13	556984.97
30	6	13419580.	230915244.	84	60	107133.54	422598.84
31	7	12677140.	217495664.	85	61	84158.178	315465.297
32	8	12016801.	204818524.	86	62	64660.012	231307.119
33	9	11417209.	192801723.	87	63	48502.414	166647.107
34	10	10864743.	181384514.	88	64	35324.954	118144.693
35	11	10344109.	170519771.	89	65	25568.585	82819.739
36	12	9844110.1	160175662.3	90	66	18584.694	57251.154
37	13	9363800.2	150331552.2	91	67	12713.175	38666.460
38	14	8902567.3	140967752.0	92	68	8384.3051	25953.2853
39	15	8458472.0	132065184.7	93	69	5561.6369	17568.9802
40	16	8025383.0	123606712.7	94	70	3784.9426	12007.3433
41	17	7601813.9	115581329.7	95	71	2601.0641	8222.4007
42	18	7193488.6	107979515.8	96	72	1813.3284	5621.3366
43	19	6802643.3	100786027.2	97	73	1277.7228	3808.0082
44	20	6431350.0	93983383.9	98	74	885.1718	2530.2854
45	21	6078687.5	87552033.9	99	75	611.38234	1645.11358
46	22	5745967.5	81473346.4	100	76	437.13963	1033.73124
47	23	5431149.8	75727378.9	101	77	294.67425	596.59161
48	24	5134436.4	70296229.1	102	78	181.51610	301.91736
49	25	4856980.8	65161792.7	103	79	93.77583	120.40126
50	26	4594669.3	60304811.9	104	80	26.62543	26.62543
51	27	4347456.4	55710142.6	Difference of Age 81 years.			
52	28	4108244.4	51362686.2	81	0	515890.02	2041568.60
53	29	3874977.2	47254441.8	82	1	365301.14	1525678.58
54	30	3647280.2	43379464.6	83	2	278844.95	1160377.44
55	31	3429401.7	39732184.4	84	3	213914.19	881532.49
56	32	3220834.7	36302782.7	85	4	167264.68	667618.30
57	33	3021865.6	33081948.0	86	5	129453.34	500353.62
58	34	2829931.4	30060082.4	87	6	99082.655	370900.276
59	35	2640958.7	27230151.0	88	7	74111.594	271817.621
60	36	2454071.8	24589192.3	89	8	55373.185	197706.027
61	37	2267497.0	22135120.5	90	9	41696.758	142332.842
62	38	2089488.7	19867623.5	91	10	29638.076	100636.084
63	39	1921609.0	17778134.8	92	11	20362.336	70998.008
64	40	1764404.0	15856525.8	93	12	14096.822	50635.672
65	41	1615650.9	14092121.8	94	13	10038.532	36538.850
66	42	1476258.4	12476470.9	95	14	7236.6016	26500.3184
67	43	1346086.2	11000212.5	96	15	5330.8300	19263.7168
68	44	1224713.3	9654126.3	97	16	4005.9203	13932.8868
69	45	1111636.6	8429413.0	98	17	2990.1594	9926.9665
70	46	1006175.9	7317776.4	99	18	2254.2671	6936.8071
71	47	908283.89	6311600.50	100	19	1769.6220	4682.5400
72	48	813863.37	5403316.61	101	20	1320.5049	2912.9180
73	49	722557.81	4589453.24	102	21	904.88693	1592.41310
74	50	634781.66	3866895.43	103	22	520.92865	687.52617
75	51	550526.38	3232113.77	104	23	166.59752	166.59752
76	52	474224.22	2681587.39				
77	53	404760.16	2207363.17				

Difference of Age 81 years.

COMMUTATION TABLES FOR JOINT ANNUITIES.

Difference of Age 25 years.

AGES.		$D_{x,y}$	$N_{x,y}$	AGES.		$D_{x,y}$	$N_{x,y}$
(x)	(y)			(x)	(y)		
25	0	24876811.	326409425.	79	54	295701.14	1495008.87
26	1	20187748.	301532614.	80	55	247616.36	1199307.73
27	2	17800732.	281344866.	81	56	206356.01	951691.37
28	3	15957332.	263544134.	82	57	169417.52	745335.36
29	4	14703687.	247586802.	83	58	137719.80	575917.84
30	5	13662805.	232883115.	84	59	110250.80	438198.04
31	6	12834787.	219220310.	85	60	87074.195	327947.243
32	7	12123437.	206385523.	86	61	67059.765	240873.048
33	8	11492819.	194262086.	87	62	50387.300	173813.283
34	9	10920244.	182769267.	88	63	36729.859	123425.983
35	10	10390754.	171849023.	89	64	26627.589	86696.124
36	11	9891792.5	161458269.3	90	65	19380.997	60068.535
37	12	9410854.4	151566476.8	91	66	13277.491	40687.538
38	13	8948942.1	142155622.4	92	67	8773.7575	27410.0469
39	14	8505463.5	133206680.3	93	68	5832.5602	18636.2894
40	15	8075373.4	124701216.8	94	69	3980.4166	12803.7292
41	16	7653152.8	116625843.4	95	70	2742.7120	8823.3126
42	17	7243572.8	108972690.6	96	71	1926.7143	6080.6006
43	18	6850338.3	101729117.8	97	72	1371.1367	4153.8863
44	19	6476760.2	94878779.5	98	73	960.17821	2782.74962
45	20	6121912.8	88402019.3	99	74	671.97306	1822.57141
46	21	5786155.8	82280106.5	100	75	483.30620	1150.59835
47	22	5469403.8	76493950.7	101	76	328.50000	667.29215
48	23	5170857.0	71024546.9	102	77	203.36387	338.79215
49	24	4891679.4	65853689.9	103	78	105.22672	135.42828
50	25	4628523.1	60962010.5	104	79	30.20156	30.20156
51	26	4379726.5	56333487.4	Difference of Age 80 years.			
52	27	4140407.1	51953760.9	80	0	607945.88	2504378.42
53	28	3908980.2	47813353.8	81	1	436494.55	1896432.54
54	29	3683481.5	43904373.6	82	2	335855.99	1459937.99
55	30	3464401.8	40220892.1	83	3	260742.79	1124082.00
56	31	3254045.2	36756490.3	84	4	205797.57	863339.21
57	32	3052791.2	33502445.1	85	5	162460.42	657541.64
58	33	2858664.3	30449653.9	86	6	127148.82	495081.22
59	34	2668048.0	27590989.6	87	7	97865.642	367932.403
60	35	2479505.0	24922941.6	88	8	73459.717	270066.761
61	36	2291679.0	22443436.6	89	9	55008.888	196607.044
62	37	2112419.2	20151757.6	90	10	41484.838	141598.156
63	38	1943309.4	18039338.4	91	11	29505.026	100113.318
64	39	1785611.6	16096029.0	92	12	20264.182	70608.292
65	40	1636939.2	14310417.4	93	13	14026.338	50344.110
66	41	1496878.2	12673478.2	94	14	9986.5105	36317.7718
67	42	1365714.9	11176600.0	95	15	7196.6204	26331.2613
68	43	1242836.4	9810885.1	96	16	5297.8296	19134.6409
69	44	1128333.5	8568048.7	97	17	3979.0478	13836.8113
70	45	1021299.9	7439715.2	98	18	2969.4845	9857.7635
71	46	921943.78	6418415.30	99	19	2238.5719	6888.2790
72	47	825924.61	5496471.52	100	20	1757.2147	4649.7071
73	48	732768.92	4670546.91	101	21	1311.1812	2892.4924
74	49	643588.05	3937777.99	102	22	898.60195	1581.31123
75	50	558013.94	3294189.94	103	23	517.28518	682.70928
76	51	481100.25	2736176.00	104	24	165.42410	165.42410
77	52	411007.94	2255075.75				
78	53	349058.94	1844067.81				

Difference of Age 80 years.

COMMUTATION TABLES FOR JOINT ANNUITIES.

Difference of Age 26 years.

AGES.		D _{x,y}	N _{x,y}	AGES.		D _{x,y}	N _{x,y}
(x)	(y)			(x)	(y)		
26	0	23859766.	310717557.	80	54	251871.98	1228306.16
27	1	19361356.	286857791.	81	55	210122.00	976434.18
28	2	17065175.	267496435.	82	56	172698.80	766312.18
29	3	15283598.	250431260.	83	57	140659.16	593613.38
30	4	14066839.	235147662.	84	58	112985.75	452954.22
31	5	13067413.	221080823.	85	59	89607.784	339968.470
32	6	12274199.	208013410.	86	60	69383.335	250360.686
33	7	11594806.	195739211.	87	61	52257.344	180977.351
34	8	10992564.	184144405.	88	62	38157.243	128720.007
35	9	10443834.	173151841.	89	63	27686.592	90562.764
36	10	9936398.6	162708007.0	90	64	20183.722	62876.172
37	11	9456438.2	152771608.4	91	65	13846.395	42692.450
38	12	8993911.7	143315170.2	92	66	9163.2097	28846.0552
39	13	8549769.8	134321258.5	93	67	6103.4835	19682.8455
40	14	8120236.6	125771488.7	94	68	4174.3141	13579.3620
41	15	7700824.5	117651252.1	95	69	2884.3597	9405.0479
42	16	7292492.2	109950427.6	96	70	2031.6385	6520.6882
43	17	6898033.4	102657935.4	97	71	1456.8728	4489.0497
44	18	6522170.4	95759902.0	98	72	1030.3765	3032.1769
45	19	6165138.1	89237731.6	99	73	728.91374	2001.80042
46	20	5827300.9	83072593.5	100	74	531.20400	1272.88668
47	21	5507657.7	77245292.6	101	75	363.19307	741.68268
48	22	5207277.6	71737634.9	102	76	226.70806	378.48961
49	23	4926378.1	66530357.3	103	77	117.89209	151.78155
50	24	4661589.6	61603979.2	104	78	33.88946	33.88946
51	25	4411996.6	56942389.6	Difference of Age 79 years.			
52	26	4171140.3	52530393.0	79	0	713736.76	3044949.14
53	27	3939582.8	48359252.7	80	1	514383.01	2331212.38
54	28	3715804.1	44419669.9	81	2	401310.85	1816829.37
55	29	3498787.9	40703865.8	82	3	314052.77	1415518.52
56	30	3287255.7	37205077.9	83	4	250849.33	1101465.75
57	31	3084268.9	33917822.2	84	5	199886.55	850616.42
58	32	2887919.7	30833553.3	85	6	159568.30	650729.87
59	33	2695137.3	27945633.6	86	7	125587.07	491161.57
60	34	2504938.2	25250496.3	87	8	97004.829	365574.499
61	35	2315429.2	22745558.1	88	9	72976.431	268569.670
62	36	2134947.4	20430128.9	89	10	54729.311	195593.239
63	37	1964635.7	18295181.5	90	11	41298.606	140863.928
64	38	1805776.3	16330545.8	91	12	29362.800	99565.322
65	39	1656614.7	14524769.5	92	13	20162.861	70202.522
66	40	1516601.5	12868154.8	93	14	13953.651	50039.661
67	41	1384790.6	11351553.3	94	15	9931.3364	36086.0099
68	42	1260959.5	9966762.7	95	16	7152.0698	26154.6735
69	43	1145030.4	8705803.2	96	17	5262.2907	19002.6037
70	44	1036639.9	7560772.8	97	18	3951.5355	13740.3130
71	45	935801.64	6524132.93	98	19	2948.8097	9788.7775
72	46	838345.87	5588331.29	99	20	2222.8767	6839.9678
73	47	743628.36	4749985.42	100	21	1744.8075	4617.0911
74	48	652683.16	4006357.06	101	22	1302.0742	2872.2836
75	49	565755.32	3353673.90	102	23	892.31698	1570.20937
76	50	487643.57	2787918.58	103	24	513.64171	677.89239
77	51	416967.37	2300275.01	104	25	164.25068	164.25068
78	52	354446.93	1883307.64				
79	53	300554.55	1528860.71				

Difference of Age 79 years.

COMMUTATION TABLES FOR JOINT ANNUITIES.

Difference of Age 27 years.

AGES.		$D_{x,y}$	$N_{x,y}$	AGES.		$D_{x,y}$	$N_{x,y}$
(x)	(y)			(x)	(y)		
27	0	22883059.	295636202.	81	54	213733.23	999676.08
28	1	18561312.	272753143.	82	55	175850.55	785942.85
29	2	16344667.	254191831.	83	56	143383.44	610092.30
30	3	14621633.	237847164.	84	57	115397.21	466708.86
31	4	13453840.	223225531.	85	58	91830.65	351311.65
32	5	12496664.	209771691.	86	59	71402.175	259481.003
33	6	11738994.	197275027.	87	60	54068.022	188078.828
34	7	11090111.	185536033.	88	61	39573.388	134010.806
35	8	10512998.	174445922.	89	62	28762.540	94437.418
36	9	9987157.3	163932924.0	90	63	20986.448	65674.878
37	10	9499081.2	153945766.7	91	64	14419.887	44688.430
38	11	9037476.0	144446685.5	92	65	9555.8282	30268.5426
39	12	8592733.4	135409209.5	93	66	6374.4069	20712.7144
40	13	8162536.1	126816476.1	94	67	4368.2116	14338.3075
41	14	7743606.9	118653940.0	95	68	3024.8652	9970.0959
42	15	7337917.4	110910333.1	96	69	2136.5628	6945.2307
43	16	6944619.2	103572415.7	97	70	1536.2106	4808.6679
44	17	6567580.6	96627796.5	98	71	1094.8051	3272.4573
45	18	6208363.4	90060215.9	99	72	782.20439	2177.65218
46	19	5868446.1	83851852.5	100	73	576.21640	1395.44779
47	20	5546822.5	77983406.4	101	74	399.18712	819.23139
48	21	5243698.2	72436583.9	102	75	250.65083	420.04427
49	22	4961076.7	67192885.7	103	76	131.42496	169.39344
50	23	4694656.1	62231809.0	104	77	37.96848	37.96848
51	24	4443516.2	57537152.9	Difference of Age 78 years.			
52	25	4201873.5	53093636.7	78	0	828921.72	3668743.90
53	26	3968825.4	48891763.2	79	1	603892.67	2839822.18
54	27	3744894.4	44922937.8	80	2	472921.10	2235929.51
55	28	3529489.8	41178043.4	81	3	375258.40	1763008.41
56	29	3319883.6	37648553.6	82	4	302136.55	1387750.01
57	30	3115746.7	34328670.0	83	5	243644.32	1085613.46
58	31	2917697.4	31212923.3	84	6	196328.17	841969.14
59	32	2722719.1	28295225.9	85	7	157608.36	645640.97
60	33	2530371.4	25572506.8	86	8	124482.43	488032.61
61	34	2339179.4	23042135.4	87	9	96366.639	363550.176
62	35	2157073.3	20702956.0	88	10	72605.536	267183.537
63	36	1985587.8	18545882.7	89	11	54483.622	194578.001
64	37	1825593.2	16530294.9	90	12	41099.530	140094.379
65	38	1675322.6	14734701.7	91	13	29215.986	98994.849
66	39	1534830.6	13059379.1	92	14	20058.374	69778.863
67	40	1403037.0	11524548.5	93	15	13876.559	49720.489
68	41	1278572.1	10121511.5	94	16	9869.8567	35843.9299
69	42	1161727.3	8842939.4	95	17	7104.0924	25974.0732
70	43	1051979.9	7681212.1	96	18	5225.9057	18869.9808
71	44	949857.47	6629232.18	97	19	3924.0232	13644.0751
72	45	850947.17	5679374.71	98	20	2928.1348	9720.0519
73	46	754811.97	4828427.54	99	21	2207.1815	6791.9171
74	47	662355.75	4073615.57	100	22	1732.6888	4584.7356
75	48	573750.53	3411259.82	101	23	1292.9673	2852.0468
76	49	494408.69	2837509.29	102	24	886.0320	1559.0795
77	50	422638.43	2343100.60	103	25	509.9982	673.0475
78	51	359586.24	1920462.17	104	26	163.0493	163.0493
79	52	305193.84	1560875.93				
80	53	256006.01	1255682.09				

Difference of Age 78 years.

COMMUTATION TABLES FOR JOINT ANNUITIES.

Difference of Age 28 years.

AGES.		D _{x,y}	N _{x,y}	AGES.		D _{x,y}	N _{x,y}
(x)	(y)			(x)	(y)		
28	0	21937492.	281138527.	82	54	178872.78	804363.27
29	1	17777635.	259201035.	83	55	146000.19	625490.49
30	2	15636745.	241423400.	84	56	117632.22	479490.30
31	3	13984458.	225786655.	85	57	93790.597	361858.076
32	4	12866214.	211802197.	86	58	73173.421	268067.479
33	5	11951758.	198935983.	87	59	55641.234	194894.058
34	6	11228023.	186984225.	88	60	40944.577	139252.824
35	7	10606290.	175756202.	89	61	29830.016	98308.247
36	8	10053297.	165149912.	90	62	21802.016	68478.231
37	9	9547605.8	155096614.8	91	63	14993.380	46676.215
38	10	9078229.6	145549009.0	92	64	9951.6129	31682.8347
39	11	8634354.4	136470779.4	93	65	6647.5328	21731.2218
40	12	8203553.9	127836425.0	94	66	4562.1091	15083.6890
41	13	7783944.5	119632871.1	95	67	3165.3706	10521.5799
42	14	7378683.6	111848926.6	96	68	2240.6409	7356.2093
43	15	6987877.5	104470243.0	97	69	1615.5484	5115.5684
44	16	6611934.8	97482365.5	98	70	1154.4256	3500.0200
45	17	6251588.8	90870430.7	99	71	831.11498	2345.59439
46	18	5909591.2	84618841.9	100	72	618.34338	1514.47941
47	19	5585987.2	78709250.7	101	73	433.01286	896.13603
48	20	5280985.9	73123263.5	102	74	275.49145	463.12317
49	21	4995775.3	67842277.6	103	75	145.30483	187.63172
50	22	4727722.6	62846502.3	104	76	42.32689	42.32689
51	23	4475035.8	58118779.7	Difference of Age 77 years.			
52	24	4231892.0	53643743.9	77	0	961197.25	4389241.58
53	25	3998067.9	49411851.9	78	1	701350.67	3428044.33
54	26	3772691.8	45413784.0	79	2	555215.82	2726693.66
55	27	3557121.5	41641092.2	80	3	442219.83	2171477.84
56	28	3349015.6	38083970.7	81	4	361019.84	1729258.01
57	29	3146672.2	34734955.1	82	5	293458.44	1368238.17
58	30	2947475.2	31588282.9	83	6	239306.97	1074779.73
59	31	2750793.4	28640807.7	84	7	193916.71	835472.76
60	32	2556267.0	25890014.3	85	8	156222.05	641556.05
61	33	2362929.6	23333747.3	86	9	123663.46	485334.00
62	34	2179199.2	20970817.7	87	10	95876.865	361670.536
63	35	2006165.8	18791618.5	88	11	72279.597	265793.671
64	36	1845062.5	16785452.7	89	12	54220.989	193514.074
65	37	1693707.9	14940390.2	90	13	40894.033	139293.085
66	38	1552163.2	13246682.3	91	14	29064.584	98399.052
67	39	1419901.1	11694519.1	92	15	19947.554	69334.468
68	40	1295418.9	10274618.0	93	16	13790.657	49386.914
69	41	1177953.9	8979199.1	94	17	9803.6477	35596.2566
70	42	1067319.9	7801245.2	95	18	7054.9726	25792.6089
71	43	963913.31	6733925.31	96	19	5189.5207	18737.6363
72	44	863728.48	5770012.00	97	20	*3896.5109	13548.1156
73	45	766157.64	4906283.52	98	21	2907.4600	9651.6047
74	46	672317.07	4140125.88	99	22	2191.8513	6744.1447
75	47	582253.35	3467808.81	100	23	1720.5700	4552.2934
76	48	501395.62	2885555.46	101	24	1283.8604	2831.7234
77	49	428501.73	2384159.84	102	25	879.74702	1547.86302
78	50	364476.88	1955658.11	103	26	506.26803	668.11600
79	51	309619.01	1591181.23	104	27	161.84797	161.84797
80	52	259957.66	1281562.22				
81	53	217241.29	1021604.56				

Difference of Age 77 years.

COMMUTATION TABLES FOR JOINT ANNUITIES.

Difference of Age 29 years.

AGES.		D_{xy}	N_{xy}	AGES.		D_{xy}	N_{xy}
(x)	(y)			(x)	(y)		
29	0	21011270.	267205600.	83	54	148509.40	639929.08
30	1	17007649.	246194330.	84	55	119779.01	491419.68
31	2	14955334.	229186681.	85	56	95607.132	371640.675
32	3	13373656.	214231347.	86	57	74735.166	276033.543
33	4	12305194.	200857691.	87	58	57021.504	201298.377
34	5	11431526.	188552497.	88	59	42135.937	144276.873
35	6	10738185.	177120971.	89	60	30863.603	102140.936
36	7	10142510.	166382786.	90	61	22611.163	71277.333
37	8	9610835.1	156240276.0	91	62	15576.048	48666.170
38	9	9124604.5	146629440.9	92	63	10347.398	33090.122
39	10	8673290.3	137504836.4	93	64	6922.8613	22742.7236
40	11	8243289.9	128831546.1	94	65	4757.5830	15819.8623
41	12	7823059.8	120588256.2	95	66	3305.8762	11062.2793
42	13	7417120.3	112765196.4	96	67	2344.7190	7756.4031
43	14	7026699.0	105348076.1	97	68	1694.2464	5411.6841
44	15	6653120.7	98321377.1	98	69	1214.0461	3717.4377
45	16	6293808.8	91668256.4	99	70	876.37551	2503.39159
46	17	5950736.3	85374447.6	100	71	657.00788	1627.01608
47	18	5625152.0	79423711.3	101	72	464.67030	970.00820
48	19	5318273.7	73798559.3	102	73	298.83566	505.33790
49	20	5031300.1	68480285.6	103	74	159.70519	206.50224
50	21	4760789.1	63448985.5	104	75	46.79705	46.79705
51	22	4506555.5	58688196.4	Difference of Age 76 years.			
52	23	4261910.5	54181640.9	76	0	1109037.0	5217212.64
53	24	4026630.4	49919730.4	77	1	813268.99	4108175.64
54	25	3800489.2	45893100.0	78	2	644818.21	3294906.65
55	26	3583525.2	42092610.8	79	3	519172.12	2650088.44
56	27	3375234.4	38509085.6	80	4	425440.53	2130916.32
57	28	3174284.3	35133851.2	81	5	350650.45	1705475.79
58	29	2976730.5	31959566.9	82	6	288234.30	1354825.34
59	30	2778867.8	28982836.4	83	7	236367.61	1066591.04
60	31	2582625.1	26203968.6	84	8	192211.05	830223.43
61	32	2387111.6	23621343.5	85	9	155194.28	638012.38
62	33	2201325.1	21234231.9	86	10	123034.96	482818.10
63	34	2026743.8	19032906.8	87	11	95446.459	359783.141
64	35	1864184.1	17006163.0	88	12	71931.181	264336.682
65	36	1711770.7	15141978.9	89	13	53949.884	192405.501
66	37	1569197.0	13430208.2	90	14	40682.113	138455.617
67	38	1435935.8	11861011.2	91	15	28904.006	97773.504
68	39	1310989.5	10425075.4	92	16	19824.069	68869.498
69	40	1193474.9	9114085.9	93	17	13698.147	49045.429
70	41	1082227.9	7920611.0	94	18	9735.8625	35347.2823
71	42	977969.13	6838383.12	95	19	7005.8529	25611.4198
72	43	876509.79	5860413.99	96	20	5153.1356	18605.5669
73	44	777665.40	4983904.20	97	21	3868.9986	13452.4313
74	45	682422.76	4206238.80	98	22	2887.2660	9583.4327
75	46	591010.00	3523816.04	99	23	2176.5211	6696.1667
76	47	508826.18	2932806.04	100	24	1708.4513	4519.6456
77	48	434557.28	2423979.86	101	25	1274.7534	2811.1943
78	49	369533.30	1989422.58	102	26	873.3124	1536.4409
79	50	313830.05	1619889.28	103	27	502.5378	663.1285
80	51	263726.92	1306059.23	104	28	160.5907	160.5907
81	52	220594.57	1042332.31				
82	53	181808.66	821737.74				

Difference of Age 76 years.

COMMUTATION TABLES FOR JOINT ANNUITIES.

Difference of Age 30 years.

AGES.		D _{xy}	N _{xy}	AGES.		D _{xy}	N _{xy}
(x)	(y)			(x)	(y)		
30	0	20101228.	253830874.	84	54	121837.57	502600.55
31	1	16266497.	233729646.	85	55	97351.962	380762.985
32	2	14302126.	217463149.	86	56	76182.636	283411.023
33	3	12790509.	203161023.	87	57	58238.516	207228.387
34	4	11769578.	190370514.	88	58	43181.187	148989.871
35	5	10932811.	178600936.	89	59	31761.639	105808.684
36	6	10268637.	167668125.	90	60	23394.623	74047.045
37	7	9696120.9	157399488.1	91	61	16154.128	50652.422
38	8	9185032.3	147703367.2	92	62	10749.515	34498.294
39	9	8717596.5	138518334.9	93	63	7198.1899	23748.7795
40	10	8280462.2	129800738.4	94	64	4954.6334	16550.5896
41	11	7860952.8	121520276.2	95	65	3447.5239	11595.9562
42	12	7454392.3	113659323.4	96	66	2448.7971	8148.4323
43	13	7063302.2	106204931.1	97	67	1772.9444	5699.6352
44	14	6690082.5	99141628.9	98	68	1273.1857	3926.6908
45	15	6333013.3	92451546.4	99	69	921.63606	2653.50508
46	16	5990924.6	86118533.1	100	70	692.78696	1731.86902
47	17	5664316.7	80127608.5	101	71	493.72574	1039.08206
48	18	5355561.4	74463291.8	102	72	320.68343	545.35632
49	19	5066824.9	69107730.4	103	73	173.23804	224.67289
50	20	4794642.9	64040905.5	104	74	51.43485	51.43485
51	21	4538075.1	59246262.6	Difference of Age 75 years.			
52	22	4291929.0	54708187.5	75	0	1269078.8	6159830.7
53	23	4055192.9	50416258.5	76	1	938356.2	4890751.9
54	24	3827640.2	46361065.6	77	2	747715.34	3952395.70
55	25	3609928.8	42533425.4	78	3	602957.66	3204680.36
56	26	3400287.9	38923496.6	79	4	499472.98	2601722.70
57	27	3199135.2	35523208.7	80	5	413220.81	2102249.72
58	28	3002851.4	32324073.5	81	6	344408.18	1689028.91
59	29	2806449.6	29321222.1	82	7	284693.97	1344620.73
60	30	2608983.1	26514772.5	83	8	234288.55	1059926.76
61	31	2411725.5	23905789.4	84	9	190946.50	825638.21
62	32	2223853.3	21494063.9	85	10	154405.52	634691.71
63	33	2047321.8	19270210.6	86	11	122482.63	480286.19
64	34	1883305.7	17222888.8	87	12	94986.368	357803.564
65	35	1729510.9	15339583.1	88	13	71571.525	262817.196
66	36	1585931.9	13610072.2	89	14	53670.307	191245.671
67	37	1451694.1	12024140.3	90	15	40457.350	137575.364
68	38	1325794.3	10572446.2	91	16	28725.077	97118.014
69	39	1207820.1	9246651.9	92	17	19691.085	68392.937
70	40	1096487.6	8038831.8	93	18	13603.434	48701.852
71	41	991629.03	6942344.25	94	19	9668.0772	35098.4178
72	42	889291.10	5950715.22	95	20	6956.7331	25430.3406
73	43	789173.17	5061424.12	96	21	5116.7506	18473.6075
74	44	692672.82	4272250.95	97	22	3842.1261	13356.8569
75	45	599893.56	3579578.13	98	23	2867.0719	9514.7308
76	46	516478.53	2979684.57	99	24	2161.1909	6647.6589
77	47	440997.30	2463206.04	100	25	1696.3326	4486.4680
78	48	374755.51	2022208.74	101	26	1265.4297	2790.1354
79	49	318183.85	1647453.23	102	27	866.87779	1524.70570
80	50	267313.80	1329269.38	103	28	498.63411	657.82791
81	51	223793.09	1061955.58	104	29	159.19380	159.19380
82	52	184615.02	838162.49				
83	53	150946.92	653547.47				

Difference of Age 75 years.

COMMUTATION TABLES FOR JOINT ANNUITIES.

Difference of Age 31 years.

AGES.		D_{xy}	N_{xy}	AGES.		D_{xy}	N_{xy}
(x)	(y)			(x)	(y)		
31	0	19225265.	241013615.	85	54	99025.086	389310.286
32	1	15556022.	221788350.	86	55	77572.969	290285.200
33	2	13678495.	206232328.	87	56	59366.480	212712.231
34	3	12233768.	192553833.	88	57	44102.805	153345.751
35	4	11256114.	180320065.	89	58	32549.537	109242.946
36	5	10454752.	169063951.	90	59	24075.334	76693.409
37	6	9816697.5	158609199.4	91	60	16713.856	52618.075
38	7	9266539.6	148792501.9	92	61	11148.466	35904.219
39	8	8775329.0	139525962.3	93	62	7477.9237	24755.7533
40	9	8322761.8	130750633.3	94	63	5151.6837	17277.8296
41	10	7896401.0	122427871.5	95	64	3590.3140	12126.1459
42	11	7490499.5	114531470.5	96	65	2553.7214	8535.8319
43	12	7098796.2	107040971.0	97	66	1851.6424	5982.1105
44	13	6724932.2	99942174.8	98	67	1332.3254	4130.4681
45	14	6368196.7	93217242.6	99	68	966.53161	2798.14272
46	15	6028242.3	86849045.9	100	69	728.56605	1831.61111
47	16	5702570.7	80820803.6	101	70	520.61286	1103.04506
48	17	5392849.2	75118232.9	102	71	340.73550	582.43220
49	18	5102349.6	69725383.7	103	72	185.90343	241.69670
50	19	4828496.7	64623034.1	104	73	55.79327	55.79327
51	20	4570345.2	59794537.4	Difference of Age 74 years.			
52	21	4321947.5	55224192.2	74	0	1443669.9	7226836.74
53	22	4083755.4	50902244.7	75	1	1073767.6	5783166.84
54	23	3854791.2	46818489.3	76	2	862719.88	4709399.24
55	24	3635718.4	42963698.1	77	3	699174.88	3846679.36
56	25	3425341.4	39327979.7	78	4	580079.42	3147504.48
57	26	3222881.6	35902638.3	79	5	485126.88	2567425.06
58	27	3026360.1	32679756.7	80	6	405864.67	2082298.18
59	28	2831076.2	29653396.6	81	7	340177.88	1676433.51
60	29	2634878.7	26822320.4	82	8	282189.84	1336255.63
61	30	2436339.3	24187441.7	83	9	232747.17	1054065.79
62	31	2246783.7	21751102.4	84	10	189976.03	821318.62
63	32	2068273.9	19504318.7	85	11	153712.37	631342.59
64	33	1902427.4	17436044.8	86	12	121892.22	477630.22
65	34	1747251.1	15533617.4	87	13	94511.436	355738.000
66	35	1602368.0	13786366.3	88	14	71200.629	261226.564
67	36	1467175.9	12183798.3	89	15	53373.786	190025.935
68	37	1340343.8	10716822.4	90	16	40206.900	136652.149
69	38	1221459.8	9376478.6	91	17	28532.383	96445.249
70	39	1109667.1	8155018.8	92	18	19554.935	67912.866
71	40	1004695.0	7045351.7	93	19	13508.721	48357.931
72	41	901712.37	6040656.67	94	20	9600.2918	34849.2100
73	42	800680.93	5138944.30	95	21	6907.6132	25248.9182
74	43	702922.87	4338263.37	96	22	5081.2118	18341.3050
75	44	608904.01	3635340.50	97	23	3815.2536	13260.0932
76	45	524241.79	3026436.49	98	24	2846.8779	9444.8396
77	46	447629.56	2502194.70	99	25	2145.8607	6597.9617
78	47	380309.28	2054565.14	100	26	1683.9253	4452.1010
79	48	322680.39	1674255.86	101	27	1256.1059	2768.1757
80	49	271022.27	1351575.47	102	28	860.14388	1512.06977
81	50	226836.84	1080553.20	103	29	494.29665	651.92589
82	51	187291.85	853716.36	104	30	157.62924	157.62924
83	52	153276.90	666424.51				
84	53	123837.32	513147.61				

Difference of Age 74 years.

COMMUTATION TABLES FOR JOINT ANNUITIES.

Difference of Age 32 years.

AGES.		D _{x,y}	N _{x,y}	AGES.		D _{x,y}	N _{x,y}
(x)	(y)			(x)	(y)		
32	0	18385559.	228735197.	86	54	78906.165	296726.865
33	1	14877715.	210349638.	87	55	60449.918	217820.700
34	2	13083102.	195471923.	88	56	44956.988	157370.782
35	3	11700054.	182388821.	89	57	33244.244	112413.794
36	4	10763919.	170688767.	90	58	24672.562	79169.550
37	5	9994621.4	159924848.1	91	59	17200.178	54496.988
38	6	9381774.1	149930226.7	92	60	11534.752	37296.810
39	7	8853200.7	140548452.6	93	61	7755.4549	25762.0578
40	8	8377879.4	131695251.9	94	62	5351.8868	18006.6029
41	9	7936738.7	123317372.5	95	63	3733.1040	12654.7161
42	10	7524277.2	115380633.8	96	64	2659.4918	8921.6121
43	11	7133181.0	107856356.6	97	65	1930.9803	6262.1203
44	12	6758725.8	100723175.6	98	66	1391.4651	4331.1400
45	13	6401369.6	93964449.8	99	67	1011.4271	2939.6749
46	14	6061732.6	87563080.2	100	68	764.0566	1928.2478
47	15	5738092.2	81501347.6	101	69	547.49999	1164.19123
48	16	5429269.8	75763255.4	102	70	359.29114	616.69124
49	17	5137874.4	70333985.6	103	71	197.52781	257.40010
50	18	4862350.5	65196111.2	104	72	59.87229	59.87229
51	19	4602615.3	60333760.7	Difference of Age 73 years.			
52	20	4352680.7	55731145.4	73	0	1620811.6	8415701.8
53	21	4112317.9	51378464.7	74	1	1221489.1	6794890.2
54	22	3881942.2	47266146.8	75	2	987216.4	5573401.1
55	23	3661508.0	43384204.6	76	3	806713.51	4586184.70
56	24	3449812.3	39722696.6	77	4	672645.83	3779471.19
57	25	3246627.9	36272884.3	78	5	563418.09	3106825.36
58	26	3048824.0	33026256.4	79	6	476490.66	2543407.27
59	27	2853240.2	29977432.4	80	7	400879.51	2066916.61
60	28	2657999.8	27124192.2	81	8	337185.72	1666037.10
61	29	2460521.4	24466192.4	82	9	280333.33	1328851.38
62	30	2269714.2	22005671.0	83	10	231564.26	1048518.05
63	31	2089600.2	19735956.8	84	11	189123.20	816953.79
64	32	1921896.7	17646356.6	85	12	152971.41	627830.59
65	33	1764991.4	15724459.9	86	13	121282.76	474859.18
66	34	1618804.0	13959468.5	87	14	94021.663	353576.425
67	35	1482381.2	12340664.5	88	15	70807.256	259554.762
68	36	1354638.1	10858283.3	89	16	53043.377	188747.506
69	37	1234864.4	9503645.2	90	17	39937.184	135704.129
70	38	1122198.3	8268780.8	91	18	28335.102	95766.945
71	39	1016771.1	7146582.5	92	19	19418.785	67431.843
72	40	913593.58	6129811.36	93	20	13414.008	48013.058
73	41	811864.53	5216217.78	94	21	9532.5065	34599.0496
74	42	713172.93	4404353.25	95	22	6859.6358	25066.5431
75	43	617914.46	3691180.32	96	23	5045.6729	18206.9073
76	44	532115.95	3073265.86	97	24	3788.3811	13161.2344
77	45	454357.94	2541149.91	98	25	2826.6839	9372.8533
78	46	386028.84	2086791.97	99	26	2130.1656	6546.1694
79	47	327462.42	1700763.13	100	27	1671.5181	4416.0038
80	48	274852.33	1373300.71	101	28	1246.3485	2744.4857
81	49	229983.77	1098448.38	102	29	852.66177	1498.13722
82	50	189839.16	868464.61	103	30	489.43871	645.47545
83	51	155499.34	678625.45	104	31	156.03674	156.03674
84	52	125748.84	523126.11				
85	53	100650.41	397377.27				

Difference of Age 73 years.

COMMUTATION TABLES FOR JOINT ANNUITIES.

Difference of Age 33 years.

AGES.		$D_{x,y}$	$N_{x,y}$	AGES.		$D_{x,y}$	$N_{x,y}$
(x)	(y)			(x)	(y)		
33	0	17583873.	216974446.	87	54	61488.832	222610.747
34	1	14230123.	199390573.	88	55	45777.453	161121.915
35	2	12512334.	185760450.	89	56	33888.118	115344.462
36	3	11188446.	172648116.	90	57	25199.149	81456.344
37	4	10290181.	161459670.	91	58	17626.856	56257.195
38	5	9551815.3	151169488.6	92	59	11870.378	38630.339
39	6	8963295.1	141617673.3	93	60	8024.1756	26759.9614
40	7	8452224.1	132654378.2	94	61	5550.5136	18735.7858
41	8	7989299.8	124202154.1	95	62	3878.1788	13185.2722
42	9	7562713.9	116212854.3	96	63	2765.2623	9307.0934
43	10	7165347.4	108650140.4	97	64	2010.9579	6541.8311
44	11	6791463.4	101484793.0	98	65	1451.0855	4530.8732
45	12	6433537.3	94693329.6	99	66	1056.3227	3079.7877
46	13	6093309.1	88259792.3	100	67	799.54714	2023.46498
47	14	5769970.5	82166483.2	101	68	574.17029	1223.91784
48	15	5463088.9	76396512.7	102	69	377.84678	649.74755
49	16	5172573.0	70933423.8	103	70	208.28471	271.90077
50	17	4896204.3	65760850.8	104	71	63.61606	63.61606
51	18	4634885.4	60864646.5	Difference of Age 72 years.			
52	19	4383413.9	56229761.1				
53	20	4141560.4	51846347.2	72	0	1800184.4	9725301.1
54	21	3909093.1	47704786.8	73	1	1371368.7	7925116.7
55	22	3687297.6	43795693.7	74	2	1123030.8	6553748.0
56	23	3474283.2	40108396.1	75	3	923127.92	5430717.22
57	24	3269822.1	36634112.9	76	4	776104.09	4507589.30
58	25	3071287.9	33364290.8	77	5	653325.77	3731485.21
59	26	2874419.1	30293002.9	78	6	553388.14	3078159.44
60	27	2678808.8	27418583.8	79	7	470638.02	2524771.30
61	28	2482112.5	24739775.0	80	8	397353.43	2054133.28
62	29	2292242.4	22257662.5	81	9	334967.39	1656779.85
63	30	2110926.4	19965420.1	82	10	278908.56	1321812.46
64	31	1941713.6	17854493.7	83	11	230524.73	1042903.90
65	32	1783054.1	15912780.1	84	12	188211.55	812379.17
66	33	1635240.1	14129726.0	85	13	152206.55	624167.62
67	34	1497586.5	12494485.9	86	14	120654.25	471961.07
68	35	1368677.1	10996899.4	87	15	93502.206	351306.817
69	36	1248033.8	9628222.3	88	16	70368.925	257804.611
70	37	1134513.6	8380188.5	89	17	52687.551	187435.686
71	38	1028253.4	7245674.9	90	18	39661.047	134748.135
72	39	924574.7	6217421.5	91	19	28137.821	95087.088
73	40	822561.89	5292846.82	92	20	19282.635	66949.267
74	41	723134.25	4470284.93	93	21	13319.294	47666.632
75	42	626924.93	3747150.68	94	22	9466.2976	34347.3385
76	43	539990.11	3120225.75	95	23	6811.6583	24881.0409
77	44	461182.44	2580235.64	96	24	5010.1340	18069.3826
78	45	391831.30	2119053.20	97	25	3761.5086	13059.2486
79	46	332387.21	1727221.90	98	26	2806.0090	9297.7400
80	47	278925.57	1394834.69	99	27	2114.4704	6491.7310
81	48	233233.88	1115909.12	100	28	1658.5337	4377.2606
82	49	192472.81	882675.24	101	29	1235.5069	2718.7269
83	50	157614.25	690202.43	102	30	844.28179	1483.22004
84	51	127572.14	532588.18	103	31	484.49400	638.93825
85	52	102204.02	405016.04	104	32	154.44425	154.44425
86	53	80201.271	302812.018				

Difference of Age 72 years.

COMMUTATION TABLES FOR JOINT ANNUITIES.

Difference of Age 34 years.

AGES.		D _{x,y}	N _{x,y}	AGES.		D _{x,y}	N _{x,y}
(x)	(y)			(x)	(y)		
34	0	16818488.	205707475.	88	54	46564.201	164643.176
35	1	13609315.	188888987.	89	55	34506.576	118078.975
36	2	11965208.	175279672.	90	56	25687.206	83572.399
37	3	10696024.	163314464.	91	57	18003.067	57885.193
38	4	9834280.3	152618439.7	92	58	12164.842	39882.126
39	5	9125751.4	142784159.4	93	59	8257.6542	27717.2836
40	6	8557332.2	133658408.0	94	60	5742.8347	19459.6294
41	7	8060196.3	125101075.8	95	61	4022.1111	13716.7947
42	8	7612798.2	117040879.5	96	62	2872.7250	9694.6836
43	9	7201950.6	109428081.3	97	63	2090.9355	6821.9586
44	10	6822088.9	102226130.7	98	64	1511.1868	4731.0231
45	11	6464699.7	95404041.8	99	65	1101.5832	3219.8363
46	12	6123928.7	88939342.1	100	66	835.03768	2118.25309
47	13	5800027.2	82815413.4	101	67	600.84059	1283.21541
48	14	5493439.4	77015386.2	102	68	396.25278	682.37482
49	15	5204793.2	71521946.8	103	69	219.04160	286.12204
50	16	4929270.8	66317153.6	104	70	67.08044	67.08044
51	17	4667155.4	61387882.8	Difference of Age 71 years.			
52	18	4414147.1	56720727.4	71	0	1979694.6	11153167.6
53	19	4170803.0	52306580.3	72	1	1523136.0	9173473.0
54	20	3936890.5	48135777.3	73	2	1260829.3	7650337.0
55	21	3713087.2	44198886.8	74	3	1050125.5	6389507.7
56	22	3498754.1	40485799.6	75	4	888101.34	5339382.17
57	23	3293016.2	36987045.5	76	5	753812.45	4451280.83
58	24	3093229.5	33694029.3	77	6	641695.28	3697468.38
59	25	2895598.0	30600799.8	78	7	546590.98	3055773.10
60	26	2698692.9	27705201.8	79	8	466498.35	2509182.12
61	27	2501544.4	25006508.9	80	9	394739.26	2042683.77
62	28	2312356.8	22504964.5	81	10	333264.95	1647944.51
63	29	2131878.6	20192607.7	82	11	277656.50	1314679.56
64	30	1961530.5	18060729.1	83	12	229413.51	1037023.06
65	31	1801439.5	16099198.6	84	13	187270.49	807609.55
66	32	1651975.0	14297759.1	85	14	151417.79	620339.06
67	33	1512791.8	12645784.1	86	15	119987.65	468921.27
68	34	1382716.1	11132992.3	87	16	92923.383	348933.622
69	35	1260968.0	9750276.2	88	17	69896.876	256010.239
70	36	1146612.7	8489308.2	89	18	52323.254	186113.363
71	37	1039537.6	7342695.5	90	19	39384.909	133790.109
72	38	935015.77	6303157.92	91	20	27940.539	94405.200
73	39	832448.84	5368142.15	92	21	19146.485	66464.661
74	40	732662.47	4535693.31	93	22	13226.784	47318.176
75	41	635681.57	3803030.84	94	23	9400.0887	34091.3925
76	42	547864.28	3167349.27	95	24	6763.6808	24691.3038
77	43	468006.94	2619484.99	96	25	4974.5951	17927.6230
78	44	397716.64	2151478.05	97	26	3733.9963	12953.0279
79	45	337383.37	1753761.41	98	27	2785.3342	9219.0316
80	46	283120.40	1416378.04	99	28	2098.0452	6433.6974
81	47	236690.34	1133257.64	100	29	1644.1067	4335.6522
82	48	195192.82	896567.30	101	30	1223.3643	2691.5455
83	49	159800.85	701374.48	102	31	835.75218	1468.18117
84	50	129307.22	541573.63	103	32	479.54929	632.42899
85	51	103685.93	412266.41	104	33	152.87970	152.87970
86	52	81439.238	308580.476				
87	53	62498.062	227141.238				

Difference of Age 71 years.

COMMUTATION TABLES FOR JOINT ANNUITIES.

Difference of Age 35 years.

AGES.		D_{xy}	N_{xy}	AGES.		D_{xy}	N_{xy}
(x)	(y)			(x)	(y)		
35	0	16084759.	194910864.	89	54	35099.618	120649.023
36	1	13014221.	178826105.	90	55	26155.998	85549.405
37	2	11438599.	165811884.	91	56	18351.750	59393.407
38	3	10222143.	154373285.	92	57	12424.476	41041.657
39	4	9395616.9	144151142.4	93	58	8462.4987	28617.1806
40	5	8712430.6	134755525.5	94	59	5909.9333	20154.6819
41	6	8160429.3	126043094.9	95	60	4161.4743	14244.7486
42	7	7680353.6	117882665.6	96	61	2979.3416	10083.2743
43	8	7249645.5	110202312.0	97	62	2172.1928	7103.9327
44	9	6856938.6	102952666.5	98	63	1571.2881	4931.7399
45	10	6493851.7	96095727.9	99	64	1147.2088	3360.4518
46	11	6153591.5	89601876.2	100	65	870.81677	2213.24299
47	12	5829173.1	83448284.7	101	66	627.51088	1342.42622
48	13	5522055.6	77619111.6	102	67	414.65878	714.91534
49	14	5233708.7	72097056.0	103	68	229.71175	300.25656
50	15	4959975.4	66863347.3	104	69	70.54481	70.54481
51	16	4698675.1	61903371.9	Difference of Age 70 years.			
52	17	4444880.3	57204696.8	70	0	2160566.7	12698935.1
53	18	4200045.5	52759816.5	71	1	1675019.6	10538368.4
54	19	3964688.0	48559771.0	72	2	1400363.4	8863348.8
55	20	3739490.8	44595083.0	73	3	1178978.3	7462985.4
56	21	3523225.0	40855592.2	74	4	1010280.2	6284007.1
57	22	3316210.4	37332367.2	75	5	862592.87	5273726.89
58	23	3115171.0	34016156.8	76	6	740393.10	4411134.02
59	24	2916284.3	30900985.8	77	7	633813.47	3670740.92
60	25	2718577.1	27984701.5	78	8	541783.24	3036927.45
61	26	2520112.8	25266124.4	79	9	463429.28	2495144.21
62	27	2330459.8	22746011.6	80	10	392733.04	2031714.93
63	28	2150585.8	20415551.8	81	11	331768.87	1638981.89
64	29	1980999.8	18264966.0	82	12	276318.08	1307213.02
65	30	1819824.8	16283966.2	83	13	228266.44	1030894.94
66	31	1669008.8	14464141.4	84	14	186300.03	802628.50
67	32	1528273.6	12795132.6	85	15	150581.23	616328.47
68	33	1396755.1	11266859.0	86	16	119244.87	465747.24
69	34	1273902.2	9870103.9	87	17	92300.035	346502.367
70	35	1158495.9	8596201.7	88	18	69413.589	254202.332
71	36	1050623.9	7437705.8	89	19	51958.957	184788.743
72	37	945276.83	6387081.92	90	20	39108.772	132829.786
73	38	841849.54	5441805.09	91	21	27743.258	93721.014
74	39	741468.86	4599955.55	92	22	19013.502	65977.756
75	40	644057.49	3858486.69	93	23	13134.274	46964.254
76	41	555516.63	3214429.20	94	24	9333.8798	33829.9803
77	42	474831.44	2658912.57	95	25	6715.7034	24496.1005
78	43	403601.99	2184081.13	96	26	4938.2101	17780.3971
79	44	342450.90	1780479.14	97	27	3706.4840	12842.1870
80	45	287376.02	1438028.24	98	28	2763.6977	9135.7030
81	46	240249.98	1150652.22	99	29	2079.7950	6372.0053
82	47	198085.52	910402.24	100	30	1627.9484	4292.2103
83	48	162059.14	712316.72	101	31	1211.0049	2664.2619
84	49	131101.11	550257.58	102	32	827.22258	1453.25701
85	50	105096.14	419156.47	103	33	474.69135	626.03443
86	51	82620.069	314060.327	104	34	151.34308	151.34308
87	52	63462.767	231440.258				
88	53	47328.468	167977.491				

Difference of Age 70 years.

COMMUTATION TABLES FOR JOINT ANNUITIES.

Difference of Age 36 years.

AGES.		D _{x,y}	N _{x,y}	AGES.		D _{x,y}	N _{x,y}
(x)	(y)			(x)	(y)		
36	0	15381422.	184565050.	90	54	26605.524	87408.800
37	1	12441444.	169183628.	91	55	18686.669	60803.276
38	2	10931819.	156742184.	92	56	12665.114	42116.607
39	3	9766178.6	145810365.3	93	57	8643.1142	29451.4928
40	4	8970073.5	136044186.7	94	58	6056.5388	20808.3786
41	5	8308334.1	127074113.2	95	59	4282.5603	14751.8398
42	6	7775863.0	118765779.1	96	60	3082.5736	10469.2795
43	7	7313978.3	110989916.1	97	61	2252.8103	7386.7059
44	8	6902348.6	103675937.8	98	62	1632.3510	5133.8956
45	9	6527024.6	96773589.2	99	63	1192.8343	3501.5446
46	10	6181340.5	90246564.6	100	64	906.88439	2308.71033
47	11	5857408.1	84065224.1	101	65	654.39801	1401.82594
48	12	5549804.6	78207816.0	102	66	433.06479	747.42793
49	13	5260971.9	72658011.4	103	67	240.38189	314.36314
50	14	4987530.9	67397039.5	104	68	73.98125	73.98125
51	15	4727943.3	62409508.6	Difference of Age 69 years.			
52	16	4474898.8	57681565.3	69	0	2351674.7	14371340.5
53	17	4229288.0	53206666.5	70	1	1828055.5	12019665.8
54	18	3992485.4	48977378.5	71	2	1540004.4	10191610.3
55	19	3765894.4	44984893.1	72	3	1309454.1	8651605.9
56	20	3548278.5	41218998.7	73	4	1134243.9	7342151.8
57	21	3339404.5	37670720.2	74	5	981262.43	6207907.95
58	22	3137112.5	34331315.7	75	6	847237.01	5226645.52
59	23	2936970.7	31194203.2	76	7	731298.99	4379408.51
60	24	2737998.8	28257232.5	77	8	628238.52	3648109.52
61	25	2538681.1	25519233.7	78	9	538218.87	3019871.00
62	26	2347758.2	22980552.6	79	10	461073.95	2481652.13
63	27	2167422.3	20632794.4	80	11	390970.00	2020578.18
64	28	1998383.1	18465372.1	81	12	330169.61	1629608.18
65	29	1837887.6	16466989.0	82	13	274936.49	1299438.57
66	30	1686042.5	14629101.4	83	14	227083.53	1024502.08
67	31	1544031.9	12943058.9	84	15	185270.75	797418.55
68	32	1411049.4	11399027.0	85	16	149649.06	612147.80
69	33	1286836.4	9987977.6	86	17	118444.95	462498.74
70	34	1170379.0	8701141.2	87	18	91661.845	344053.787
71	35	1061512.2	7530762.2	88	19	68930.302	252391.942
72	36	955357.86	6469250.05	89	20	51594.660	183461.640
73	37	851088.17	5513892.19	90	21	38832.634	131866.980
74	38	749842.15	4662804.02	91	22	27550.565	93034.346
75	39	651798.88	3912961.87	92	23	18880.518	65483.781
76	40	562836.28	3261162.99	93	24	13041.763	46603.263
77	41	481463.70	2698326.71	94	25	9267.6709	33561.4997
78	42	409487.33	2216863.01	95	26	6666.5836	24293.8288
79	43	347518.43	1807375.68	96	27	4901.8251	17627.2452
80	44	291692.43	1459857.25	97	28	3677.6920	12725.4201
81	45	243861.21	1168164.82	98	29	2739.6572	9047.7281
82	46	201064.58	924303.61	99	30	2059.3547	6308.0709
83	47	164460.81	723239.03	100	31	1611.5015	4248.7162
84	48	132953.82	558778.22	101	32	1198.6455	2637.2147
85	49	106554.15	425824.40	102	33	818.84261	1438.56920
86	50	83743.763	319270.246	103	34	469.92014	619.72659
87	51	64382.948	235526.483	104	35	149.80645	149.80645
88	52	48059.019	171143.535				
89	53	35675.716	123084.516				

Difference of Age 69 years.

COMMUTATION TABLES FOR JOINT ANNUITIES.

Difference of Age 37 years.

AGES.		D _{x,y}	N _{x,y}	AGES.		D _{x,y}	N _{x,y}
(x)	(y)			(x)	(y)		
37	0	14704460.	174650698.	91	54	19007.825	62128.993
38	1	11890232.	159946238.	92	55	12896.252	43121.168
39	2	10444199.	148056006.	93	56	8810.514	30224.916
40	3	9323851.8	137611806.6	94	57	6185.8038	21414.4025
41	4	8554027.0	128287954.8	95	58	4388.7961	15228.5987
42	5	7916797.6	119733927.8	96	59	3172.2669	10839.8026
43	6	7404931.7	111817130.2	97	60	2330.8685	7667.5357
44	7	6963599.6	104412198.5	98	61	1692.9331	5336.6672
45	8	6570249.9	97448598.9	99	62	1239.1899	3643.7341
46	9	6212917.0	90878349.0	100	63	942.95202	2404.54417
47	10	5883821.6	84665432.0	101	64	681.50198	1461.59215
48	11	5576686.5	78781610.4	102	65	451.62043	780.09017
49	12	5287409.0	73204923.9	103	66	251.05204	328.46974
50	13	5013511.7	67917514.9	104	67	77.41770	77.41770
51	14	4754209.7	62904003.2	Difference of Age 68 years.			
52	15	4502773.1	58149793.5	68	0	2552549.6	16177496.9
53	16	4257850.5	53647020.4	69	1	1989752.0	13624947.3
54	17	4020282.8	49389169.9	70	2	1680704.8	11635195.3
55	18	3792298.1	45368887.1	71	3	1440029.8	9954490.5
56	19	3573332.0	41576589.0	72	4	1259769.0	8514460.7
57	20	3363150.9	38003257.0	73	5	1101665.6	7254691.7
58	21	3159054.0	34640106.1	74	6	963794.02	6153026.12
59	22	2957657.1	31481052.1	75	7	836830.56	5189232.10
60	23	2757420.5	28523395.0	76	8	724866.58	4352401.54
61	24	2556817.6	25765974.5	77	9	624105.37	3627534.96
62	25	2365056.7	23209156.9	78	10	535483.43	3003429.59
63	26	2183510.6	20844100.2	79	11	459004.11	2467946.16
64	27	2014028.1	18660589.6	80	12	389085.36	2008942.05
65	28	1854015.0	16646561.5	81	13	328518.76	1619856.69
66	29	1702777.4	14792546.5	82	14	273511.72	1291337.93
67	30	1559790.1	13089769.1	83	15	225828.92	1017826.21
68	31	1425598.9	11529979.0	84	16	184123.83	791997.29
69	32	1300005.8	10104380.1	85	17	148645.19	607873.46
70	33	1182262.1	8804374.3	86	18	117625.99	459228.27
71	34	1072400.6	7622112.2	87	19	91023.656	341602.277
72	35	965258.88	6549711.62	88	20	68447.014	250578.621
73	36	860164.72	5584452.74	89	21	51230.362	182131.607
74	37	758071.07	4724288.02	90	22	38562.919	130901.245
75	38	659159.53	3966216.95	91	23	27357.871	92338.326
76	39	569601.40	3307057.42	92	24	18747.534	64980.455
77	40	487807.60	2737456.02	93	25	12949.253	46232.921
78	41	415206.89	2249648.42	94	26	9199.8856	33283.6682
79	42	352585.96	1834441.53	95	27	6617.4639	24083.7826
80	43	296008.85	1481855.57	96	28	4863.7477	17466.3187
81	44	247524.03	1185846.72	97	29	3645.7010	12602.5710
82	45	204086.81	938322.69	98	30	2712.7318	8956.8700
83	46	166934.17	734235.88	99	31	2038.5495	6244.1382
84	47	134924.15	567301.71	100	32	1595.0547	4205.5887
85	48	108059.96	432377.56	101	33	1186.5029	2610.5340
86	49	84905.548	324317.601	102	34	810.61229	1424.03106
87	50	65258.603	239412.053	103	35	465.14894	613.41877
88	51	48755.853	174153.450	104	36	148.26983	148.26983
89	52	36226.398	125397.597				
90	53	27042.206	89171.199				

Difference of Age 68 years.

COMMUTATION TABLES FOR JOINT ANNUITIES.

Difference of Age 38 years.

AGES.		D _{xy}	N _{xy}	AGES.		D _{xy}	N _{xy}
(x)	(y)			(x)	(y)		
38	0	14052987.	165151873.	92	54	13117.891	44064.887
39	1	11359862.	151098886.	93	55	8971.3059	30946.9961
40	2	9971163.4	139739024.0	94	56	6305.6104	21975.6902
41	3	8891396.4	129767860.6	95	57	4482.4664	15670.0798
42	4	8150912.1	120876464.2	96	58	3250.9601	11187.6134
43	5	7539143.3	112725552.1	97	59	2398.6895	7936.6533
44	6	7050195.8	105186408.8	98	60	1751.5920	5537.9638
45	7	6628553.9	98136213.0	99	61	1285.1804	3786.3718
46	8	6254062.2	91507659.1	100	62	979.59673	2501.19144
47	9	5913878.2	85253596.9	101	63	708.60593	1521.59471
48	10	5601834.0	79339718.7	102	64	470.32572	812.98878
49	11	5313019.8	73737884.7	103	65	261.80893	342.66306
50	12	5038705.2	68424864.9	104	66	80.85413	80.85413
51	13	4778975.1	63386159.7	Difference of Age 67 years.			
52	14	4527788.5	58607184.6	67	0	2764605.0	18125486.2
53	15	4284372.8	54079396.1	68	1	2159712.2	15360881.2
54	16	4047433.8	49795023.3	69	2	1829367.7	13201169.0
55	17	3818701.7	45747589.5	70	3	1571596.2	11371801.3
56	18	3598385.6	41928887.8	71	4	1385390.3	9800205.1
57	19	3386897.3	38330502.2	72	5	1223585.3	8414814.8
58	20	3181517.9	34943604.9	73	6	1082053.8	7191229.5
59	21	2978343.4	31762087.0	74	7	951955.93	6109175.70
60	22	2776842.2	28783743.6	75	8	829469.91	5157219.77
61	23	2574954.2	26006901.4	76	9	720097.72	4327749.86
62	24	2381952.8	23431947.2	77	10	620933.42	3607652.14
63	25	2199598.8	21049994.4	78	11	533079.56	2986718.72
64	26	2028977.7	18850395.6	79	12	456791.53	2453639.16
65	27	1868529.8	16821417.9	80	13	387139.94	1996847.63
66	28	1717719.3	14952888.1	81	14	326816.33	1609707.69
67	29	1575271.9	13235168.8	82	15	272000.61	1282891.36
68	30	1440148.5	11659896.9	83	16	224430.94	1010890.75
69	31	1313410.3	10219748.4	84	17	182888.69	786459.81
70	32	1194361.3	8906338.1	85	18	147617.41	603571.12
71	33	1083288.9	7711976.8	86	19	116807.03	455953.71
72	34	975159.89	6628687.90	87	20	90385.466	339146.681
73	35	869079.18	5653528.01	88	21	67963.727	248761.215
74	36	766155.62	4784448.83	89	22	50874.537	180797.488
75	37	666393.28	4018293.21	90	23	38293.203	129922.951
76	38	576033.81	3351899.93	91	24	27165.178	91629.748
77	39	493670.91	2775866.12	92	25	18614.551	64464.570
78	40	420677.77	2282195.21	93	26	12854.540	45850.019
79	41	357510.74	1861517.44	94	27	9132.1002	32995.4786
80	42	300325.26	1504006.70	95	28	6566.0594	23863.3784
81	43	251186.85	1203681.44	96	29	4821.4396	17297.3190
82	44	207152.21	952494.59	97	30	3609.8710	12475.8794
83	45	169443.38	745342.38	98	31	2685.3256	8866.0084
84	46	136953.31	575899.00	99	32	2017.7442	6180.6828
85	47	109661.38	438945.69	100	33	1578.8964	4162.9386
86	48	86105.424	329284.315	101	34	1174.5772	2584.0422
87	49	66163.942	243178.891	102	35	802.38196	1409.46497
88	50	49418.969	177014.949	103	36	460.37773	607.08301
89	51	36751.664	127595.980	104	37	146.70528	146.70528
90	52	27459.624	90844.316				
91	53	19319.805	63384.692				

Difference of Age 67 years.

COMMUTATION TABLES FOR JOINT ANNUITIES.

Difference of Age 39 years.

AGES.		D_{xy}	N_{xy}	AGES.		D_{xy}	N_{xy}
(x)	(y)			(x)	(y)		
39	0	13426146.	156052816.3	93	54	9125.4898	31624.3663
40	1	10845355.	142626670.3	94	55	6420.6878	22498.8765
41	2	9508684.8	131781315.3	95	56	4569.2828	16078.1887
42	3	8472382.8	122272630.5	96	57	3320.3455	11508.9059
43	4	7762089.9	113800247.7	97	58	2458.1929	8188.5604
44	5	7177978.0	106038157.8	98	59	1802.5579	5730.3675
45	6	6710983.5	98860179.8	99	60	1329.7110	3927.8096
46	7	6309560.3	92149196.3	100	61	1015.9529	2598.0986
47	8	5953043.0	85839636.0	101	62	736.14355	1582.14566
48	9	5630450.2	79886593.0	102	63	489.03101	846.00211
49	10	5336978.4	74256142.8	103	64	272.65258	356.97110
50	11	5063111.4	68919164.4	104	65	84.31852	84.31852
51	12	4802990.0	63856053.0	Difference of Age 66 years.			
52	13	4551374.5	59053063.0	66	0	2988377.4	20223345.9
53	14	4308174.9	54501688.5	67	1	2339132.3	17234968.5
54	15	4072645.4	50193513.6	68	2	1985628.3	14895836.2
55	16	3844491.3	46120868.2	69	3	1710608.2	12910207.9
56	17	3623439.1	42276376.9	70	4	1511964.6	11199599.7
57	18	3410643.7	38652937.8	71	5	1345598.4	9687635.1
58	19	3203981.8	35242294.1	72	6	1201803.1	8342036.7
59	20	2999522.3	32038312.3	73	7	1068763.2	7140233.6
60	21	2796263.9	29038790.0	74	8	943582.64	6071470.40
61	22	2593090.7	26242526.1	75	9	824012.86	5127887.76
62	23	2398849.0	23649435.4	76	10	716437.90	4303874.90
63	24	2215312.9	21250586.4	77	11	618145.95	3587437.00
64	25	2043927.4	19035273.5	78	12	530509.90	2969291.05
65	26	1882399.4	16991346.1	79	13	454507.57	2438781.15
66	27	1731167.0	15108946.7	80	14	385133.71	1984273.58
67	28	1589094.9	13377779.7	81	15	325010.71	1599139.87
68	29	1454442.8	11788684.8	82	16	270316.80	1274129.16
69	30	1326814.9	10334242.0	83	17	222925.41	1003812.36
70	31	1206676.5	9007427.1	84	18	181624.15	780886.95
71	32	1094375.2	7800750.6	85	19	146589.63	599262.80
72	33	985060.91	6706375.39	86	20	115988.06	452673.17
73	34	877993.64	5721314.48	87	21	89747.276	336685.112
74	35	774095.80	4843320.84	88	22	67491.678	246937.836
75	36	673500.12	4069225.04	89	23	50518.712	179446.158
76	37	582355.32	3395724.92	90	24	38023.487	128927.446
77	38	499245.85	2813369.60	91	25	26972.484	90903.959
78	39	425734.19	2314123.75	92	26	18478.401	63931.475
79	40	362221.40	1888389.56	93	27	12759.827	45453.074
80	41	304520.09	1526168.16	94	28	9061.1621	32693.2468
81	42	254849.67	1221648.07	95	29	6508.9434	23632.0847
82	43	210217.61	966798.40	96	30	4774.0544	17123.1413
83	44	171988.44	756580.79	97	31	3573.4012	12349.0869
84	45	139011.87	584592.35	98	32	2657.9194	8775.6857
85	46	111310.60	445580.48	99	33	1997.3040	6117.7663
86	47	87381.483	334269.884	100	34	1563.0266	4120.4623
87	48	67098.964	246888.401	101	35	1162.6515	2557.4357
88	49	50104.563	179789.437	102	36	794.15164	1394.78420
89	50	37251.514	129684.874	103	37	455.51979	600.63256
90	51	27857.775	92433.360	104	38	145.11277	145.11277
91	52	19618.021	64575.585				
92	53	13333.198	44957.564				

Difference of Age 66 years.

COMMUTATION TABLES FOR JOINT ANNUITIES.

Difference of Age 40 years.

AGES.		D _{x,y}	N _{x,y}	AGES.		D _{x,y}	N _{x,y}
(x)	(y)			(x)	(y)		
40	0	12818053.	147337607.7	94	54	6531.0360	22988.6569
41	1	10342330.	134519554.7	95	55	4652.6722	16457.6209
42	2	9060580.9	124177224.7	96	56	3384.6540	11804.9487
43	3	8068225.5	115116643.8	97	57	2510.6582	8420.2947
44	4	7390244.2	107048418.3	98	58	1847.2732	5909.6365
45	5	6832617.6	99658174.1	99	59	1368.4014	4062.3633
46	6	6388023.1	92825556.5	100	60	1051.1549	2693.9619
47	7	6005869.9	86437533.4	101	61	763.46434	1642.80697
48	8	5667737.9	80431663.5	102	62	508.03558	879.34263
49	9	5364241.6	74763925.6	103	63	283.49622	371.30705
50	10	5085943.1	69399684.0	104	64	87.81083	87.81083
51	11	4826254.5	64313740.9	Difference of Age 65 years.			
52	12	4574245.7	59487486.4				
53	13	4330616.8	54913240.7	65	0	3225495.9	22480354.5
54	14	4095271.2	50582623.9	66	1	2528466.1	19254858.6
55	15	3868438.8	46487352.7	67	2	2150586.2	16726392.5
56	16	3647910.0	42618913.9	68	3	1856724.6	14575806.3
57	17	3434390.1	38971003.9	69	4	1645701.9	12719081.7
58	18	3226445.7	35536613.8	70	5	1468537.2	11073379.8
59	19	3020701.2	32310168.1	71	6	1321644.1	9604842.6
60	20	2816148.0	29289466.9	72	7	1187041.6	8283198.5
61	21	2611227.2	26473318.9	73	8	1059362.5	7096156.9
62	22	2415745.1	23862091.7	74	9	937374.87	6036794.38
63	23	2231027.0	21446346.6	75	10	819824.90	5099419.51
64	24	2058529.3	19215319.6	76	11	713221.69	4279594.61
65	25	1896269.0	17156790.3	77	12	615166.24	3566372.92
66	26	1744017.0	15260521.3	78	13	527857.35	2951206.68
67	27	1601535.7	13516504.3	79	14	452152.24	2423349.33
68	28	1467205.5	11914968.6	80	15	383005.90	1971197.09
69	29	1339984.2	10447763.1	81	16	322998.74	1588191.19
70	30	1218991.7	9107778.9	82	17	268503.46	1265192.45
71	31	1105659.4	7888787.2	83	18	221384.04	996688.99
72	32	995141.94	6783127.77	84	19	180359.60	775304.95
73	33	886908.10	5787985.83	85	20	145561.86	594945.35
74	34	782035.99	4901077.73	86	21	115169.10	449383.49
75	35	680480.05	4119041.74	87	22	89123.928	334214.393
76	36	588565.94	3438561.69	88	23	67019.630	245090.465
77	37	504724.68	2849995.75	89	24	50162.887	178070.835
78	38	430541.94	2345271.07	90	25	37753.772	127907.948
79	39	366575.20	1914729.13	91	26	26775.203	90154.176
80	40	308532.53	1548153.93	92	27	18342.251	63378.973
81	41	258409.31	1239621.40	93	28	12660.708	45036.722
82	42	213283.02	981212.09	94	29	8982.342	32376.014
83	43	174533.50	767929.07	95	30	6444.9733	23393.6723
84	44	141099.85	593395.57	96	31	4725.8231	16948.6990
85	45	112983.73	452295.72	97	32	3536.9314	12222.8759
86	46	88695.634	339311.995	98	33	2630.9941	8685.9445
87	47	68093.353	250616.361	99	34	1977.2287	6054.9504
88	48	50812.635	182523.008	100	35	1547.1569	4077.7217
89	49	37768.307	131710.373	101	36	1150.7257	2530.5648
90	50	28236.662	93942.066	102	37	785.77166	1379.83908
91	51	19902.473	65705.404	103	38	450.57508	594.06742
92	52	13539.006	45802.931	104	39	143.49234	143.49234
93	53	9275.2686	32263.9255				

Difference of Age 65 years.

COMMUTATION TABLES FOR JOINT ANNUITIES.

Difference of Age 41 years.

AGES.		D_{xy}	N_{xy}	AGES.		D_{xy}	N_{xy}
(x)	(y)			(x)	(y)		
41	0	12223531.	138995823.	95	54	4732.6347	16811.7547
42	1	9854939.5	126772292.0	96	55	3446.4239	12079.1200
43	2	8628364.9	116917352.5	97	56	2559.2846	8632.6961
44	3	7681714.3	108288987.6	98	57	1886.6997	6073.4115
45	4	7034670.9	100607273.3	99	58	1402.3468	4186.7118
46	5	6503803.7	93572602.4	100	59	1081.7402	2784.3650
47	6	6080556.1	87068798.7	101	60	789.91782	1702.62483
48	7	5718033.1	80988242.6	102	61	526.89050	912.70701
49	8	5399766.4	75270209.5	103	62	294.51336	385.81651
50	9	5111923.9	69870443.1	104	63	91.30315	91.30315
51	10	4848018.0	64758519.2	Difference of Age 64 years.			
52	11	4596402.2	59910501.2	64	0	3476658.2	24905958.9
53	12	4352378.7	55314099.0	65	1	2729092.1	21429300.7
54	13	4116604.1	50961720.3	66	2	2324658.8	18700208.6
55	14	3889930.1	46845116.2	67	3	2010973.7	16375549.8
56	15	3670632.9	42955186.1	68	4	1786274.2	14364576.1
57	16	3457584.2	39284553.2	69	5	1598433.3	12578301.9
58	17	3248909.6	35826969.0	70	6	1442394.3	10979868.6
59	18	3041880.1	32578059.4	71	7	1305410.6	9537474.3
60	19	2836032.2	29536179.3	72	8	1176600.5	8232063.7
61	20	2629795.5	26700147.1	73	9	1052393.0	7055463.2
62	21	2432641.2	24070351.6	74	10	932610.76	6003070.24
63	22	2246741.1	21637710.4	75	11	816144.58	5070459.48
64	23	2073131.3	19390969.3	76	12	709783.68	4254314.90
65	24	1909816.1	17317838.0	77	13	612090.41	3544531.22
66	25	1756867.1	15408021.9	78	14	525121.91	2932440.81
67	26	1613423.5	13651154.8	79	15	449654.16	2407318.90
68	27	1478692.0	12037731.3	80	16	380634.92	1957664.74
69	28	1351742.6	10559039.3	81	17	320832.00	1577029.82
70	29	1231090.9	9207296.7	82	18	266646.95	1256197.82
71	30	1116943.7	7976205.8	83	19	219842.67	989550.87
72	31	1005403.0	6859262.1	84	20	179095.05	769708.20
73	32	895984.65	5853859.12	85	21	144534.08	590613.15
74	33	789976.17	4957874.47	86	22	114369.18	446079.07
75	34	687459.99	4167898.30	87	23	88500.58	331709.89
76	35	594665.64	3480438.31	88	24	66547.581	243209.308
77	36	510107.38	2885772.67	89	25	49807.061	176661.727
78	37	435266.79	2375665.29	90	26	37477.634	126854.666
79	38	370714.87	1940398.50	91	27	26577.922	89377.032
80	39	312241.00	1569683.63	92	28	18199.768	62799.110
81	40	261814.18	1257442.63	93	29	12550.577	44599.342
82	41	216262.07	995628.45	94	30	8894.0635	32048.7648
83	42	177078.55	779366.38	95	31	6379.8611	23154.7013
84	43	143187.82	602287.83	96	32	4677.5918	16774.8402
85	44	114680.75	459100.01	97	33	3501.1014	12097.2484
86	45	90028.83	344419.26	98	34	2604.5495	8596.1470
87	46	69117.424	254390.427	99	35	1957.1535	5991.5975
88	47	51565.665	185273.003	100	36	1531.2871	4034.4440
89	48	38302.045	133707.338	101	37	1138.5831	2503.1569
90	49	28628.391	95405.293	102	38	777.24206	1364.57377
91	50	20173.161	66776.902	103	39	445.54362	587.33171
92	51	13735.316	46603.741	104	40	141.78809	141.78809
93	52	9418.4395	32868.4255				
94	53	6638.2313	23449.9860				

Difference of Age 64 years.

COMMUTATION TABLES FOR JOINT ANNUITIES.

Difference of Age 42 years.

AGES.		D _{x,y}	N _{x,y}	AGES.		D _{x,y}	N _{x,y}
(x)	(y)			(x)	(y)		
42	0	11647488.	131023166.7	96	54	3505.6553	12334.0839
43	1	9384830.4	119375678.7	97	55	2605.9916	8828.4286
44	2	8215020.0	109990848.3	98	56	1923.2413	6222.4370
45	3	7312117.2	101775828.3	99	57	1432.2772	4299.1957
46	4	6696133.3	94463711.1	100	58	1108.5746	2866.9185
47	5	6190763.9	87767577.8	101	59	812.90198	1758.34393
48	6	5789139.9	81576813.9	102	60	545.14686	945.44195
49	7	5447683.5	75787674.0	103	61	305.44375	400.29509
50	8	5145777.7	70339990.5	104	62	94.85134	94.85134
51	9	4872783.5	65194212.8	Difference of Age 63 years.			
52	10	4617129.2	60321429.3	63	0	3741450.6	27508790.3
53	11	4373460.6	55704300.1	64	1	2941600.5	23767339.7
54	12	4137290.6	51330839.5	65	2	2509113.3	20825739.2
55	13	3910193.3	47193548.9	66	3	2173745.7	18316625.9
56	14	3691025.3	43283355.6	67	4	1934670.6	16142880.2
57	15	3479121.6	39592330.3	68	5	1734968.0	14208209.6
58	16	3270851.1	36113208.7	69	6	1569978.0	12473241.6
59	17	3063059.0	32842357.6	70	7	1424677.7	10903263.6
60	18	2855916.3	29779298.6	71	8	1293928.4	9478585.9
61	19	2648363.9	26923382.3	72	9	1168859.7	8184657.5
62	20	2449939.6	24275018.4	73	10	1047044.3	7015797.8
63	21	2262455.2	21825078.8	74	11	928424.12	5968753.50
64	22	2087733.2	19562623.6	75	12	812210.43	5040329.38
65	23	1923363.2	17474890.4	76	13	706234.76	4228118.95
66	24	1769418.3	15551527.2	77	14	608918.46	3521884.19
67	25	1625311.3	13782108.9	78	15	522220.68	2912965.73
68	26	1489667.9	12156797.6	79	16	446870.59	2390745.05
69	27	1362325.1	10667129.7	80	17	378081.54	1943874.46
70	28	1241893.7	9304804.6	81	18	318613.68	1565792.92
71	29	1128030.0	8062910.9	82	19	264790.43	1247179.24
72	30	1015664.0	6934880.9	83	20	218301.29	982388.81
73	31	905223.28	5919216.91	84	21	177830.51	764087.52
74	32	798060.72	5013993.63	85	22	143530.21	586257.01
75	33	694439.92	4215932.91	86	23	113569.26	442726.80
76	34	600765.35	3521492.99	87	24	87877.232	329157.544
77	35	515393.96	2920727.64	88	25	66075.533	241280.312
78	36	439908.76	2405333.68	89	26	49442.764	175204.779
79	37	374783.17	1965424.92	90	27	37201.497	125762.015
80	38	315767.09	1590641.75	91	28	26371.465	88560.518
81	39	264961.11	1274874.66	92	29	18041.454	62189.053
82	40	219111.60	1009913.55	93	30	12427.230	44147.599
83	41	179551.92	790801.95	94	31	8804.2085	31720.3695
84	42	145275.79	611250.03	95	32	6314.7488	22916.1610
85	43	116377.78	465974.24	96	33	4630.2066	16601.4122
86	44	91381.071	349596.464	97	34	3465.9112	11971.2056
87	45	70156.337	258215.393	98	35	2578.1049	8505.2944
88	46	52341.173	188059.056	99	36	1937.0782	5927.1895
89	47	38869.671	135717.883	100	37	1515.1288	3990.1113
90	48	29032.965	96848.212	101	38	1126.2237	2474.9825
91	49	20453.025	67815.247	102	39	768.5628	1348.7588
92	50	13922.126	47362.222	103	40	440.2519	580.1960
93	51	9555.0024	33440.0962	104	41	139.9441	139.9441
94	52	6740.6975	23885.0938				
95	53	4810.3124	17144.3963				

Difference of Age 63 years.

COMMUTATION TABLES FOR JOINT ANNUITIES.

Difference of Age 43 years.

AGES.		D_{xy}	N_{xy}	AGES.		D_{xy}	N_{xy}
(x)	(y)			(x)	(y)		
43	0	11091869.	123410446.4	97	54	2650.7791	9009.8469
44	1	8935246.8	112318577.4	98	55	1958.3404	6359.0678
45	2	7819763.5	103383330.6	99	56	1460.0175	4400.7274
46	3	6960227.7	95563567.1	100	57	1132.2349	2940.7099
47	4	6373836.4	88603339.4	101	58	833.06731	1808.47501
48	5	5894065.9	82229503.0	102	59	561.00894	975.40770
49	6	5515428.5	76335437.1	103	60	316.02716	414.39876
50	7	5191441.0	70820008.6	104	61	98.37160	98.37160
51	8	4905053.5	65628567.6	Difference of Age 62 years.			
52	9	4640715.2	60723514.1	62	0	4022889.4	30300291.6
53	10	4393182.3	56082798.9	63	1	3165641.3	26277402.2
54	11	4157330.6	51689616.6	64	2	2704492.4	23111760.9
55	12	3929842.6	47532286.0	65	3	2346225.7	20407268.5
56	13	3710252.5	43602443.4	66	4	2091266.5	18061042.8
57	14	3498450.1	39892190.9	67	5	1879102.0	15969776.3
58	15	3291225.4	36393740.8	68	6	1704082.1	14090674.3
59	16	3083745.3	33102515.4	69	7	1550694.3	12386592.2
60	17	2875800.4	30018770.1	70	8	1412146.4	10835897.9
61	18	2666932.2	27142969.7	71	9	1285415.7	9423751.5
62	19	2467238.1	24476037.5	72	10	1162919.1	8138335.8
63	20	2278543.4	22008799.4	73	11	1042343.9	6975416.7
64	21	2102335.2	19730256.0	74	12	923948.74	5933072.85
65	22	1936910.3	17627920.8	75	13	808149.37	5009124.11
66	23	1781969.4	15691010.5	76	14	702574.94	4200974.74
67	24	1636922.6	13909041.1	77	15	605554.27	3498399.80
68	25	1500643.9	12272118.5	78	16	518987.89	2892845.53
69	26	1372037.3	10771474.6	79	17	443872.89	2373857.64
70	27	1251616.3	9399437.3	80	18	375467.38	1929984.75
71	28	1137928.5	8147821.0	81	19	316395.35	1554517.37
72	29	1025745.1	7009892.5	82	20	262933.92	1238122.02
73	30	914461.91	5984147.37	83	21	216759.92	975188.10
74	31	806289.63	5069685.46	84	22	176595.37	758428.18
75	32	701546.76	4263395.83	85	23	142526.33	581832.81
76	33	606865.05	3561849.07	86	24	112769.35	439306.48
77	34	520680.55	2954984.02	87	25	87253.884	326537.129
78	35	444467.83	2434303.47	88	26	65592.245	239283.245
79	36	378780.10	1989835.64	89	27	49078.467	173691.000
80	37	319232.38	1611055.54	90	28	36912.516	124612.533
81	38	267953.28	1291823.16	91	29	26142.068	87700.017
82	39	221745.26	1023869.88	92	30	17864.143	61557.949
83	40	181917.74	802124.62	93	31	12301.680	43693.806
84	41	147304.95	620206.88	94	32	8714.3536	31392.1265
85	42	118074.81	472901.93	95	33	6250.7788	22677.7729
86	43	92733.314	354827.125	96	34	4583.6676	16426.9941
87	44	71210.093	262093.811	97	35	3430.7211	11843.3265
88	45	53127.921	190883.718	98	36	2551.6604	8412.6054
89	46	39454.241	137755.797	99	37	1916.6380	5860.9450
90	47	29463.226	98301.556	100	38	1498.6820	3944.3070
91	48	20742.065	68838.330	101	39	1113.6475	2445.6250
92	49	14115.269	48096.265	102	40	759.43462	1331.97750
93	50	9684.9575	33980.9965	103	41	434.52649	572.54288
94	51	6838.4345	24296.0390	104	42	138.01639	138.01639
95	52	4884.5632	17457.6045				
96	53	3563.1944	12573.0413				

Difference of Age 62 years.

COMMUTATION TABLES FOR JOINT ANNUITIES.

Difference of Age 44 years.

AGES.		D _{xy}	N _{xy}	AGES.		D _{xy}	N _{xy}
(x)	(y)			(x)	(y)		
44	0	10560509.	116148567.4	98	54	1991.9971	6485.5997
45	1	8505337.3	105588058.4	99	55	1486.6628	4493.6026
46	2	7443444.0	97082721.1	100	56	1154.1640	3006.9398
47	3	6625219.5	89639277.1	101	57	850.84751	1852.77584
48	4	6068364.5	83014057.6	102	58	574.92567	1001.92833
49	5	5615393.5	76945693.1	103	59	325.22256	427.00266
50	6	5255999.4	71330299.6	104	60	101.78010	101.78010
51	7	4948580.6	66074300.2	Difference of Age 61 years.			
52	8	4671448.4	61125719.6				
53	9	4415624.3	56454271.2	61	0	4318219.3	33288522.2
54	10	4176077.7	52038646.9	62	1	3403766.7	28970302.9
55	11	3948877.7	47862569.2	63	2	2910474.4	25566536.2
56	12	3728897.0	43913691.5	64	3	2528921.2	22656061.8
57	13	3516674.1	40184794.5	65	4	2257202.0	20127140.6
58	14	3309510.0	36668120.4	66	5	2031190.1	17869938.6
59	15	3102954.1	33358610.4	67	6	1845650.3	15838748.5
60	16	2895222.1	30255656.3	68	7	1683151.2	13993098.2
61	17	2685500.6	27360434.2	69	8	1537054.6	12309947.0
62	18	2484536.5	24674933.6	70	9	1402856.0	10772892.4
63	19	2294631.7	22190397.1	71	10	1278882.7	9370036.4
64	20	2117284.8	19895765.4	72	11	1157698.6	8091153.7
65	21	1950457.4	17778480.6	73	12	1037319.4	6933455.1
66	22	1794520.6	15828023.2	74	13	919329.0	5896135.7
67	23	1648534.0	14033502.6	75	14	803961.42	4976806.71
68	24	1511364.6	12384968.6	76	15	698693.31	4172845.29
69	25	1382549.6	10873604.0	77	16	601805.60	3474151.98
70	26	1260906.7	9491054.4	78	17	515506.42	2872346.38
71	27	1146837.1	8230147.7	79	18	440803.82	2356839.96
72	28	1034746.0	7083310.6	80	19	372853.21	1916036.14
73	29	923538.45	6048564.56	81	20	314177.02	1543182.93
74	30	814518.55	5125026.11	82	21	261077.41	1229005.91
75	31	708780.51	4310507.56	83	22	215254.39	967928.50
76	32	613075.65	3601727.05	84	23	175360.23	752674.11
77	33	525967.13	2988651.40	85	24	141522.46	577313.88
78	34	449026.90	2462684.27	86	25	111969.43	435791.42
79	35	382705.65	2013657.37	87	26	86615.695	323821.994
80	36	322636.88	1630951.72	88	27	65108.958	237206.299
81	37	270893.85	1308314.84	89	28	48697.225	172097.341
82	38	224249.39	1037420.99	90	29	36591.425	123400.116
83	39	184104.34	813171.60	91	30	25885.143	86808.691
84	40	149245.88	629067.26	92	31	17683.665	60923.548
85	41	119724.03	479821.38	93	32	12176.130	43239.883
86	42	94085.555	360097.354	94	33	8626.075	31063.753
87	43	72263.848	266011.799	95	34	6187.9512	22437.6776
88	44	53925.907	193747.951	96	35	4537.1286	16249.7264
89	45	40047.283	139822.044	97	36	3395.5309	11712.5978
90	46	29906.330	99774.761	98	37	2524.7350	8317.0669
91	47	21049.457	69868.431	99	38	1895.8327	5792.3319
92	48	14314.745	48818.974	100	39	1481.9466	3896.4992
93	49	9819.3178	34504.2289	101	40	1100.4208	2414.5526
94	50	6931.4422	24684.9111	102	41	749.55823	1314.13178
95	51	4955.3872	17753.4689	103	42	428.54080	564.57355
96	52	3618.1951	12798.0817	104	43	136.03275	136.03275
97	53	2694.2869	9179.8866				

Difference of Age 61 years.

COMMUTATION TABLES FOR JOINT ANNUITIES.

Difference of Age 45 years.

AGES.		D_{xy}	N_{xy}	AGES.		D_{xy}	N_{xy}
(x)	(y)			(x)	(y)		
45	0	10052402.	109221962.6	99	54	1512.2131	4579.9955
46	1	8096025.1	99169560.6	100	55	1175.2275	3067.7824
47	2	7085177.7	91073535.5	101	56	867.32672	1892.55490
48	3	6307699.8	83988357.8	102	57	587.19635	1025.22818
49	4	5781451.2	77680658.0	103	58	333.29024	438.03183
50	5	5351262.4	71899206.8	104	59	104.74159	104.74159
51	6	5010118.9	66547944.4	Difference of Age 60 years.			
52	7	4712902.5	61537825.5	60	0	4624216.8	36478463.9
53	8	4444866.8	56824923.0	61	1	3653645.3	31854247.1
54	9	4197410.6	52380056.2	62	2	3129405.7	28200601.8
55	10	3966684.8	48182645.6	63	3	2721531.2	25071196.1
56	11	3746958.8	44215960.8	64	4	2432965.4	22349664.9
57	12	3534345.8	40469002.0	65	5	2192369.6	19916699.5
58	13	3326749.7	36934656.2	66	6	1995040.7	17724329.9
59	14	3120192.7	33607906.5	67	7	1822980.5	15729289.2
60	15	2913256.6	30487713.8	68	8	1668346.4	13906308.7
61	16	2703637.1	27574457.2	69	9	1526942.4	12237962.3
62	17	2501834.9	24870820.1	70	10	1395726.1	10711019.9
63	18	2310719.9	22368985.2	71	11	1273141.6	9315293.8
64	19	2132234.5	20058265.3	72	12	1152118.0	8042152.2
65	20	1964327.0	17926030.8	73	13	1032132.8	6890034.2
66	21	1807071.8	15961703.8	74	14	914564.88	5857901.38
67	22	1660145.3	14154632.0	75	15	799519.64	4943336.50
68	23	1522085.3	12494486.7	76	16	694368.06	4143816.86
69	24	1392426.6	10972401.4	77	17	597768.57	3449448.80
70	25	1270197.2	9579974.8	78	18	511942.05	2851680.23
71	26	1155349.8	8309777.6	79	19	437734.75	2339738.18
72	27	1042846.8	7154427.8	80	20	370239.04	1902003.43
73	28	931642.51	6111581.00	81	21	311958.69	1531764.39
74	29	822603.11	5179938.49	82	22	259264.07	1219805.70
75	30	716014.27	4357335.38	83	23	213748.87	960541.63
76	31	619397.17	3641321.11	84	24	174125.09	746792.76
77	32	531349.84	3021923.94	85	25	140518.58	572667.67
78	33	453585.96	2490574.10	86	26	111150.47	432149.09
79	34	386631.20	2036988.14	87	27	85977.505	320998.624
80	35	325980.58	1650356.94	88	28	64603.192	235021.119
81	36	273782.83	1324376.36	89	29	48273.624	170417.927
82	37	226710.35	1050593.53	90	30	36231.805	122144.303
83	38	186183.40	823883.18	91	31	25623.631	85912.498
84	39	151039.77	637699.78	92	32	17503.187	60288.867
85	40	121301.55	486660.01	93	33	12052.783	42785.680
86	41	95399.706	365358.456	94	34	8539.3728	30732.8972
87	42	73317.603	269958.750	95	35	6125.1235	22193.5244
88	43	54723.894	196641.147	96	36	4490.5896	16068.4009
89	44	40648.797	141917.253	97	37	3359.7009	11577.8113
90	45	30355.856	101268.456	98	38	2497.3288	8218.1104
91	46	21366.025	70912.600	99	39	1874.6625	5720.7816
92	47	14526.885	49546.575	100	40	1464.3456	3846.1191
93	48	9958.0834	35019.6904	101	41	1086.1099	2381.7735
94	49	7027.6027	25061.6070	102	42	739.23291	1295.66364
95	50	5022.7841	18034.0043	103	43	422.38161	556.43073
96	51	3670.6572	13011.2202	104	44	134.04912	134.04912
97	52	2735.8753	9340.5630				
98	53	2024.6922	6604.6877				

Difference of Age 60 years.

COMMUTATION TABLES FOR JOINT ANNUITIES.

Difference of Age 46 years.

AGES.		D _{xy}	N _{xy}	AGES.		D _{xy}	N _{xy}
(x)	(y)			(x)	(y)		
46	0	9568638.6	102617635.4	100	54	1195.4254	3124.8935
47	1	7706348.9	93048996.8	101	55	883.15544	1929.46813
48	2	6745614.1	85342647.9	102	56	598.56916	1046.31269
49	3	6009470.7	78597033.8	103	57	340.40366	447.74353
50	4	5509509.2	72587563.1	104	58	107.33987	107.33987
51	5	5100925.5	67078053.9	Difference of Age 59 years.			
52	6	4771510.0	61977128.4				
53	7	4484310.2	57205618.4	59	0	4925324.0	39859926.2
54	8	4225208.0	52721308.2	60	1	3912549.8	34934602.2
55	9	3986948.1	48496100.2	61	2	3359142.8	31022052.4
56	10	3763855.4	44509152.1	62	3	2926249.8	27662909.6
57	11	3551465.3	40745296.7	63	4	2618267.1	24736659.8
58	12	3343467.1	37193831.4	64	5	2363084.6	22118392.7
59	13	3136446.3	33850364.3	65	6	2153341.1	19755308.1
60	14	2929441.3	30713918.0	66	7	1970536.1	17601967.0
61	15	2720478.2	27784476.7	67	8	1806945.8	15631430.9
62	16	2518731.1	25063998.5	68	9	1657370.4	13824485.1
63	17	2326808.1	22545267.4	69	10	1519181.9	12167114.7
64	18	2147184.1	20218459.3	70	11	1389460.4	10647932.8
65	19	1978196.6	18071275.2	71	12	1267004.5	9258472.4
66	20	1819921.8	16093078.6	72	13	1146357.4	7991467.9
67	21	1671756.6	14273156.8	73	14	1026784.1	6845110.5
68	22	1532806.0	12601400.2	74	15	909512.04	5818326.38
69	23	1402303.6	11068594.2	75	16	794570.24	4908814.34
70	24	1279271.5	9666290.6	76	17	689710.11	4114244.10
71	25	1163862.5	8387019.1	77	18	593635.42	3424533.99
72	26	1050587.6	7223156.6	78	19	508377.69	2830898.57
73	27	938936.15	6172568.96	79	20	434665.69	2322520.88
74	28	829821.46	5233632.81	80	21	367624.87	1887855.19
75	29	723121.10	4403811.35	81	22	309791.96	1520230.32
76	30	625718.68	3680690.25	82	23	257450.74	1210438.36
77	31	536828.66	3054971.57	83	24	212243.34	952987.62
78	32	458227.93	2518142.91	84	25	172889.95	740744.28
79	33	390556.75	2059914.98	85	26	139490.80	567854.33
80	34	329324.28	1669358.23	86	27	110331.50	428363.53
81	35	276620.23	1340033.95	87	28	85309.632	318032.033
82	36	229128.13	1063413.72	88	29	64041.229	232722.401
83	37	188226.62	834285.59	89	30	47799.190	168681.172
84	38	152745.44	646058.97	90	31	35865.762	120881.982
85	39	122759.56	493313.53	91	32	25362.118	85016.220
86	40	96656.719	370553.966	92	33	17325.875	59654.102
87	41	74341.675	273897.247	93	34	11931.639	42328.227
88	42	55521.880	199555.572	94	35	8452.6708	30396.5879
89	43	41250.312	144033.692	95	36	6062.2959	21943.9171
90	44	30811.804	102783.380	96	37	4443.2045	15881.6212
91	45	21687.180	71971.576	97	38	3323.2311	11438.4167
92	46	14745.358	50284.396	98	39	2469.4418	8115.1856
93	47	10105.659	35539.038	99	40	1852.3972	5645.7438
94	48	7126.9162	25433.3788	100	41	1445.3019	3793.3466
95	49	5092.4657	18306.4626	101	42	1071.1485	2348.0447
96	50	3720.5809	13213.9969	102	43	728.60831	1276.89620
97	51	2775.5442	9493.4160	103	44	416.22241	548.28789
98	52	2055.9449	6717.8718	104	45	132.06548	132.06548
99	53	1537.0334	4661.9269				

Difference of Age 59 years.

COMMUTATION TABLES FOR JOINT ANNUITIES.

Difference of Age 47 years.

AGES.		D_{xy}	N_{xy}	AGES.		D_{xy}	N_{xy}
(x)	(y)			(x)	(y)		
47	0	9108082.9	96320781.0	101	54	898.33366	1964.45414
48	1	7337015.1	87212698.1	102	55	609.49305	1066.12048
49	2	6426680.4	79875683.0	103	56	346.99660	456.62743
50	3	5726803.4	73449002.6	104	57	109.63083	109.63083
51	4	5251769.4	67722199.2	Difference of Age 58 years.			
52	5	4857991.9	62470429.8	58	0	5224167.3	43427982.7
53	6	4540075.1	57612437.9	59	1	4167316.6	38203815.4
54	7	4262702.2	53072362.8	60	2	3597178.3	34036498.8
55	8	4013351.7	48809660.6	61	3	3141072.7	30439320.5
56	9	3783082.5	44796308.9	62	4	2815218.0	27298247.8
57	10	3567480.3	41013226.4	63	5	2543064.0	24483029.8
58	11	3359662.0	37445746.1	64	6	2321017.0	21939965.8
59	12	3152207.4	34086084.1	65	7	2126892.0	19618948.8
60	13	2944701.2	30933876.7	66	8	1953203.5	17492056.8
61	14	2735591.9	27989175.5	67	9	1795058.0	15538853.3
62	15	2534420.3	25253583.6	68	10	1648947.0	13743795.3
63	16	2342522.2	22719163.3	69	11	1512362.0	12094848.3
64	17	2162133.7	20376641.1	70	12	1382762.7	10582486.3
65	18	1992066.3	18214507.4	71	13	1260669.5	9199723.6
66	19	1832771.8	16222441.1	72	14	1140416.8	7939054.1
67	20	1683644.4	14389669.3	73	15	1021111.3	6798637.3
68	21	1543526.7	12706024.9	74	16	903881.73	5777526.05
69	22	1412180.7	11162498.2	75	17	789240.11	4873644.32
70	23	1288345.9	9750317.5	76	18	684941.25	4084404.21
71	24	1172177.2	8461971.6	77	19	589502.27	3399462.96
72	25	1058328.4	7289794.4	78	20	504813.33	2809960.69
73	26	945905.65	6231465.96	79	21	431596.62	2305147.36
74	27	836317.97	5285560.31	80	22	365071.50	1873550.74
75	28	729466.50	4449242.34	81	23	307625.22	1508479.24
76	29	631929.28	3719775.84	82	24	255637.40	1200854.02
77	30	542307.49	3087846.56	83	25	210737.82	945216.62
78	31	462952.78	2545539.07	84	26	171625.41	734478.80
79	32	394553.68	2082586.29	85	27	138463.03	562853.39
80	33	332667.98	1688032.61	86	28	109474.45	424390.36
81	34	279457.62	1355364.63	87	29	84567.551	314915.915
82	35	231502.74	1075907.01	88	30	63411.831	230348.364
83	36	190233.98	844404.27	89	31	47316.285	166936.533
84	37	154421.70	654170.29	90	32	35499.719	119620.248
85	38	124145.86	499748.59	91	33	25105.194	84120.529
86	39	97818.505	375602.726	92	34	17151.730	59015.335
87	40	75321.221	277784.221	93	35	11810.494	41863.605
88	41	56297.388	202463.000	94	36	8365.9686	30053.1112
89	42	41851.826	146165.612	95	37	5998.3259	21687.1426
90	43	31267.752	104313.786	96	38	4394.9732	15688.8167
91	44	22012.924	73046.034	97	39	3286.1215	11293.8435
92	45	14966.998	51033.110	98	40	2440.1124	8007.7220
93	46	10257.641	36066.112	99	41	1828.3069	5567.6096
94	47	7232.5351	25808.4715	100	42	1425.3926	3739.3027
95	48	5164.4318	18575.9364	101	43	1055.7534	2313.9101
96	49	3772.1968	13411.5046	102	44	717.98371	1258.15671
97	50	2813.2936	9639.3078	103	45	410.06322	540.17300
98	51	2085.7552	6826.0142	104	46	130.10978	130.10978
99	52	1560.7587	4740.2590				
100	53	1215.0462	3179.5003				

Difference of. Age 58 years.

COMMUTATION TABLES FOR JOINT ANNUITIES.

Difference of Age 48 years.

AGES.		D _{xy}	N _{xy}	AGES.		D _{xy}	N _{xy}
(x)	(y)			(x)	(y)		
48	0	8671569.7	90317489.0	102	54	619.96801	1085.05146
49	1	6990119.9	81645919.3	103	55	353.32929	465.08345
50	2	6124388.7	74655799.4	104	56	111.75416	111.75416
51	3	5458898.3	68531410.7	Difference of Age 57 years.			
52	4	5001651.8	63072512.4	57	0	5522415.3	47180136.4
53	5	4622362.2	58070860.6	58	1	4420167.9	41657721.1
54	6	4315711.2	53448498.4	59	2	3831409.5	37237553.2
55	7	4048965.9	49132787.2	60	3	3363655.3	33406143.7
56	8	3808136.0	45083821.3	61	4	3021889.9	30042488.4
57	9	3585704.2	41275685.3	62	5	2734357.9	27020598.5
58	10	3374812.1	37689981.1	63	6	2497792.4	24286240.6
59	11	3167475.9	34315169.0	64	7	2292508.4	21788448.2
60	12	2959498.7	31147693.1	65	8	2108184.1	19495939.8
61	13	2749842.1	28188194.4	66	9	1940353.4	17387755.7
62	14	2548500.4	25438352.3	67	10	1785934.8	15447402.3
63	15	2357113.9	22889851.9	68	11	1641544.6	13661467.5
64	16	2176735.7	20532738.0	69	12	1505071.8	12019922.9
65	17	2005935.9	18356002.3	70	13	1375848.9	10514851.1
66	18	1845621.9	16350066.4	71	14	1254136.5	9139002.2
67	19	1695532.2	14504444.5	72	15	1134116.2	7884865.7
68	20	1554502.7	12808912.3	73	16	1014790.1	6750749.5
69	21	1422057.7	11254409.6	74	17	897818.31	5735959.42
70	22	1297420.3	9832351.9	75	18	783783.07	4838141.11
71	23	1180491.9	8534931.6	76	19	680172.39	4054358.04
72	24	1065889.2	7354439.7	77	20	585369.12	3374185.65
73	25	952875.14	6288550.51	78	21	501248.96	2788816.53
74	26	842525.75	5335675.37	79	22	428598.92	2287567.57
75	27	735177.35	4493149.62	80	23	362518.13	1858968.65
76	28	637474.47	3757972.27	81	24	305458.48	1496450.52
77	29	547690.19	3120497.80	82	25	253824.06	1190992.04
78	30	467677.63	2572807.61	83	26	209196.44	937167.98
79	31	398621.98	2105129.98	84	27	170360.86	727971.54
80	32	336072.48	1706508.00	85	28	137387.45	557610.68
81	33	282295.02	1370435.52	86	29	108522.16	420223.23
82	34	233877.35	1088140.50	87	30	83736.42	311701.07
83	35	192205.51	854263.15	88	31	62771.194	227964.651
84	36	156068.55	662057.64	89	32	46833.379	165193.457
85	37	125508.26	505989.09	90	33	35140.098	118360.078
86	38	98923.153	380480.830	91	34	24852.857	83219.980
87	39	76226.561	281557.677	92	35	16977.585	58367.123
88	40	57039.178	205331.116	93	36	11689.349	41389.538
89	41	42436.396	148291.938	94	37	8277.690	29700.189
90	42	31723.700	105855.542	95	38	5933.2138	21422.4989
91	43	22338.668	74131.842	96	39	4345.8957	15489.2851
92	44	15191.804	51793.174	97	40	3247.0924	11143.3894
93	45	10411.825	36601.370	98	41	2408.3789	7896.2970
94	46	7341.3069	26189.5452	99	42	1803.1216	5487.9181
95	47	5240.9674	18848.2383	100	43	1404.9062	3684.7965
96	48	3825.5051	13607.2709	101	44	1040.3584	2279.8903
97	49	2852.3227	9781.7658	102	45	707.35911	1239.53192
98	50	2114.1230	6929.4431	103	46	403.99079	532.17281
99	51	1583.3890	4815.3201	104	47	128.18202	128.18202
100	52	1233.8014	3231.9311				
101	53	913.07821	1998.12967				

Difference of Age 57 years.

COMMUTATION TABLES FOR JOINT ANNUITIES.

Difference of Age 49 years.

AGES.		D _{x,y}	N _{x,y}	AGES.		D _{x,y}	N _{x,y}
(x)	(y)			(x)	(y)		
49	0	8261576.5	84592659.6	103	54	359.40173	473.19541
50	1	6661325.8	76331083.1	104	55	113.79368	113.79368
51	2	5837884.3	69669757.3	Difference of Age 56 years.			
52	3	5198916.1	63831873.0	56	0	5826401.5	51120625.1
53	4	4759054.1	58632956.9	57	1	4672515.6	45294223.6
54	5	4393931.9	53873902.8	58	2	4063879.7	40621708.0
55	6	4099317.0	49479970.9	59	3	3582680.7	36557828.3
56	7	3841929.1	45380653.9	60	4	3236026.9	32975147.6
57	8	3609450.6	41538724.8	61	5	2935093.6	29739120.7
58	9	3392051.8	37929274.2	62	6	2685681.0	26804027.1
59	10	3181759.3	34537222.4	63	7	2467112.5	24118346.1
60	11	2973833.8	31355463.1	64	8	2272343.8	21651233.6
61	12	2763660.3	28381629.3	65	9	2094314.5	19378889.8
62	13	2561776.0	25617969.0	66	10	1930491.8	17284575.3
63	14	2370209.0	23056193.0	67	11	1777917.5	15354083.5
64	15	2190294.7	20685984.0	68	12	1633631.7	13576166.0
65	16	2019483.0	18495689.3	69	13	1497546.4	11942534.3
66	17	1858471.9	16476206.3	70	14	1368719.0	10444987.9
67	18	1707420.0	14617734.4	71	15	1247207.6	9076268.9
68	19	1565478.7	12910314.4	72	16	1127095.5	7829061.3
69	20	1432169.9	11344835.7	73	17	1007982.7	6701965.8
70	21	1306494.7	9912665.8	74	18	891610.53	5693983.12
71	22	1188806.6	8606171.1	75	19	778326.03	4802372.59
72	23	1073450.0	7417364.5	76	20	675403.53	4024046.56
73	24	959682.54	6343914.49	77	21	581235.98	3348643.03
74	25	848733.53	5384231.95	78	22	497767.49	2767407.05
75	26	740634.39	4535498.42	79	23	425601.23	2269639.56
76	27	642465.13	3794864.03	80	24	359964.76	1844038.33
77	28	552496.18	3152398.90	81	25	303291.74	1484073.57
78	29	472319.59	2599902.72	82	26	251967.55	1180781.83
79	30	402690.28	2127583.13	83	27	207655.07	928814.28
80	31	339537.77	1724892.85	84	28	169037.50	721159.21
81	32	285184.00	1385355.08	85	29	136192.36	552121.71
82	33	236251.96	1100171.08	86	30	107455.61	415929.35
83	34	194177.03	863919.12	87	31	82890.448	308473.741
84	35	157685.99	669742.09	88	32	62130.557	225583.293
85	36	126846.76	512056.10	89	33	46358.945	163452.736
86	37	100008.76	385209.34	90	34	34786.899	117093.791
87	38	77087.374	285200.582	91	35	24600.521	82306.892
88	39	57724.772	208113.208	92	36	16803.439	57706.371
89	40	42995.550	150388.436	93	37	11566.002	40902.932
90	41	32166.804	107392.886	94	38	8187.8351	29336.9299
91	42	22664.411	75226.082	95	39	5866.9591	21149.0948
92	43	15416.609	52561.671	96	40	4294.2797	15282.1357
93	44	10568.211	37145.062	97	41	3204.8642	10987.8560
94	45	7451.6551	26576.8510	98	42	2375.2030	7782.9918
95	46	5319.7874	19125.1959	99	43	1777.2063	5407.7888
96	47	3882.1981	13805.4085	100	44	1384.4198	3630.5825
97	48	2892.6315	9923.2104	101	45	1024.9633	2246.1627
98	49	2143.4524	7030.5789	102	46	696.88414	1221.19937
99	50	1604.9242	4887.1265	103	47	398.00509	524.31523
100	51	1251.6909	3282.2023	104	48	126.31014	126.31014
101	52	927.17227	2030.51136				
102	53	630.14368	1103.33909				

Difference of Age 56 years.

COMMUTATION TABLES FOR JOINT ANNUITIES.

Difference of Age 50 years.

AGES.		D _{x,y}	N _{x,y}	AGES.		D _{x,y}	N _{x,y}
(x)	(y)			(x)	(y)		
50	0	7872976.9	79127289.7	104	54	115.74937	115.74937
51	1	6349702.9	71254312.8	Difference of Age 55 years.			
52	2	5559852.7	64904609.9	55	0	6140379.0	55257165.5
53	3	4946750.5	59344757.2	56	1	4929718.3	49116786.5
54	4	4523868.6	54398006.7	57	2	4295886.9	44187068.2
55	5	4173615.6	49874138.1	58	3	3800059.3	39891181.3
56	6	3889705.6	45700522.5	59	4	3446741.7	36091122.0
57	7	3641480.6	41810816.9	60	5	3143080.2	32644380.3
58	8	3414515.7	38169336.3	61	6	2882843.2	29501300.1
59	9	3198012.9	34754820.6	62	7	2652693.3	26618456.9
60	10	2987244.0	31556807.7	63	8	2445412.1	23965763.6
61	11	2777046.8	28569563.7	64	9	2257394.2	21520351.5
62	12	2574649.2	25792516.9	65	10	2083670.4	19262957.3
63	13	2382555.7	23217867.7	66	11	1921825.5	17179286.9
64	14	2202463.0	20835312.0	67	12	1769347.2	15257461.4
65	15	2032062.4	18632849.0	68	13	1625463.6	13488114.2
66	16	1871023.1	16600786.6	69	14	1489785.9	11862650.6
67	17	1719307.8	14729763.5	70	15	1361157.0	10372864.7
68	18	1576454.6	13010455.7	71	16	1239486.8	9011707.7
69	19	1442282.1	11434001.1	72	17	1119534.7	7772220.9
70	20	1315785.1	9991719.0	73	18	1001013.2	6652686.2
71	21	1197121.3	8675933.9	74	19	885402.75	5651673.03
72	22	1081010.7	7478812.6	75	20	772868.99	4766270.28
73	23	966489.95	6397801.90	76	21	670634.68	3993401.29
74	24	854796.95	5431311.95	77	22	577198.95	3322766.61
75	25	746091.42	4576515.00	78	23	494286.02	2745567.66
76	26	647233.99	3830423.58	79	24	422603.54	2251281.64
77	27	556821.57	3183189.59	80	25	357411.38	1828678.10
78	28	476464.20	2626368.02	81	26	301073.42	1471266.72
79	29	406687.21	2149903.82	82	27	250111.04	1170193.30
80	30	343003.07	1743216.61	83	28	206042.01	920082.26
81	31	288124.58	1400213.54	84	29	167567.10	714040.25
82	32	238669.74	1112088.96	85	30	134853.86	546473.15
83	33	196148.55	873419.22	86	31	106370.00	411619.29
84	34	159303.43	677270.67	87	32	82044.475	305249.289
85	35	128161.36	517967.24	88	33	61501.159	223204.814
86	36	101075.31	389805.88	89	34	45892.984	161703.655
87	37	77933.347	288730.570	90	35	34433.700	115810.671
88	38	58376.649	210797.223	91	36	24348.184	81376.971
89	39	43512.343	152420.574	92	37	16626.128	57028.787
90	40	32590.643	108908.231	93	38	11440.452	40402.659
91	41	22980.979	76317.588	94	39	8096.4038	28962.2073
92	42	15641.415	53336.609	95	40	5797.2775	20865.8035
93	43	10724.598	37695.194	96	41	4238.4329	15068.5260
94	44	7563.5796	26970.5965	97	42	3160.7165	10830.0931
95	45	5399.7499	19407.0169	98	43	2341.0654	7669.3766
96	46	3940.5834	14007.2670	99	44	1751.2910	5328.3112
97	47	2935.4995	10066.6836	100	45	1363.9334	3577.0202
98	48	2173.7435	7131.1841	101	46	1009.7851	2213.0868
99	49	1627.1895	4957.4406	102	47	686.55882	1203.30174
100	50	1268.7148	3330.2511	103	48	392.19290	516.74292
101	51	940.61582	2061.53629	104	49	124.55002	124.55002
102	52	639.87043	1120.92047				
103	53	365.30067	481.05004				

Difference of Age 55 years.

COMMUTATION TABLES FOR JOINT ANNUITIES.

Difference of Age 51 years.

AGES.		$D_{x,y}$	$N_{x,y}$	AGES.		$D_{x,y}$	$N_{x,y}$
(x)	(y)			(x)	(y)		
51	0	7504671.9	73906592.8	Difference of Age 54 years.			
52	1	6047295.8	66401920.9	54	0	6464516.5	59596699.7
53	2	5290180.4	60354625.1	55	1	5195374.7	53132183.2
54	3	4702289.3	55064444.7	56	2	4532357.7	47936808.5
55	4	4297037.2	50362155.4	57	3	4017004.9	43404450.8
56	5	3960205.1	46065118.2	58	4	3655872.3	39387445.9
57	6	3686764.5	42104913.1	59	5	3347742.7	35731573.6
58	7	3444815.9	38418148.6	60	6	3087127.1	32383830.9
59	8	3219191.8	34973332.7	61	7	2847433.8	29296703.8
60	9	3002504.0	31754140.9	62	8	2629360.5	26449270.0
61	10	2789569.7	28751636.9	63	9	2429323.9	23819909.5
62	11	2587120.2	25962067.2	64	10	2245921.2	21390585.6
63	12	2394528.4	23374947.0	65	11	2074316.4	19144664.4
64	13	2213935.9	20980418.6	66	12	1912561.5	17070348.0
65	14	2043351.7	18766482.7	67	13	1760500.5	15157786.5
66	15	1882677.8	16723131.0	68	14	1617040.2	13397286.0
67	16	1730919.2	14840453.2	69	15	1481555.1	11780245.8
68	17	1587430.6	13109534.0	70	16	1352730.8	10298690.7
69	18	1452394.3	11522103.4	71	17	1231172.1	8945959.9
70	19	1325075.6	10069709.1	72	18	1111793.9	7714787.8
71	20	1205634.0	8744633.5	73	19	994043.75	6602993.94
72	21	1088571.5	7538999.5	74	20	879194.97	5608950.19
73	22	973297.37	6450428.02	75	21	767411.96	4729755.22
74	23	860860.36	5477130.65	76	22	665976.72	3962343.26
75	24	751421.56	4616270.29	77	23	573161.92	3296366.54
76	25	652002.85	3864848.73	78	24	490804.55	2723204.62
77	26	560954.71	3212845.88	79	25	419605.84	2232400.07
78	27	480194.35	2651891.17	80	26	354797.22	1812794.23
79	28	410255.89	2171696.82	81	27	298855.09	1457997.01
80	29	346407.56	1761440.93	82	28	248168.18	1159141.92
81	30	291065.15	1415033.37	83	29	204249.72	910973.74
82	31	241130.70	1123968.22	84	30	165920.25	706724.02
83	32	198155.92	882837.52	85	31	133491.46	540803.77
84	33	160920.88	684681.60	86	32	105284.40	407312.31
85	34	129475.96	523760.72	87	33	81213.344	302027.911
86	35	102122.82	394284.76	88	34	60883.001	220814.567
87	36	78764.477	292161.937	89	35	45427.022	159931.566
88	37	59017.285	213397.460	90	36	34080.501	114504.544
89	38	44003.721	154380.175	91	37	24091.260	80424.043
90	39	32982.373	110376.454	92	38	16445.650	56332.783
91	40	23283.783	77394.081	93	39	11312.700	39887.133
92	41	15859.888	54110.298	94	40	8000.2432	28574.4335
93	42	10880.985	38250.410	95	41	5721.8844	20574.1903
94	43	7675.5043	27369.4250	96	42	4180.0476	14852.3059
95	44	5480.8548	19693.9207	97	43	3115.2892	10672.2583
96	45	3999.8148	14213.0659	98	44	2306.9279	7556.9691
97	46	2979.6471	10213.2511	99	45	1725.3757	5250.0412
98	47	2205.9577	7233.6040	100	46	1343.7355	3524.6655
99	48	1650.1848	5027.6463	101	47	934.82374	2180.93000
100	49	1286.3158	3377.4615	102	48	676.53279	1186.10626
101	50	953.40889	2091.14571	103	49	386.72771	509.57347
102	51	649.14826	1137.73682	104	50	122.84576	122.84576
103	52	370.93936	488.58856				
104	53	117.64920	117.64920				

Difference of Age 54 years.

COMMUTATION TABLES FOR JOINT ANNUITIES.

Difference of Age 52 years.

AGES.		D _{xy}	N _{xy}	AGES.		D _{xy}	N _{xy}
(x)	(y)			(x)	(y)		
Difference of Age 53 years.							
52	0	7147258.9	68915295.2	53	0	6800591.8	64147365.8
53	1	5753980.7	61768036.3	54	1	5469627.4	57346774.0
54	2	5028747.4	56014055.6	55	2	4776600.8	51877146.6
55	3	4466511.7	50985308.2	56	3	4238124.4	47100545.8
56	4	4077315.8	46518796.5	57	4	3864586.2	42862421.4
57	5	3753585.7	42441480.7	58	5	3550866.5	38997835.2
58	6	3487654.1	38687895.0	59	6	3288146.3	35446968.7
59	7	3247758.6	35200240.9	60	7	3049208.6	32158822.4
60	8	3022388.1	31952482.3	61	8	2822388.1	29109613.8
61	9	2803819.8	28930094.2	62	9	2612062.1	26287225.7
62	10	2598786.6	26126274.4	63	10	2416977.1	23675163.6
63	11	2406126.9	23527487.8	64	11	2235838.9	21258186.5
64	12	2225061.2	21121360.9	65	12	2064317.4	19022347.6
65	13	2053995.8	18896299.7	66	13	1902998.7	16958030.2
66	14	1893137.1	16842303.9	67	14	1751377.3	15055031.5
67	15	1741701.1	14949166.8	68	15	1608106.2	13303654.2
68	16	1598151.3	13207465.7	69	16	1472383.5	11695548.0
69	17	1462506.5	11609314.4	70	17	1343656.4	10223164.5
70	18	1334366.0	10146807.9	71	18	1222659.4	8879508.1
71	19	1214146.7	8812441.9	72	19	1104053.1	7656848.7
72	20	1096312.3	7598295.2	73	20	987074.26	6552795.59
73	21	980104.78	6501982.92	74	21	872987.19	5565721.33
74	22	866923.77	5521878.14	75	22	762081.82	4692734.14
75	23	756751.68	4654954.37	76	23	661318.76	3930652.32
76	24	656660.80	3898202.69	77	24	569124.89	3269333.56
77	25	565087.86	3241541.89	78	25	487323.08	2700208.67
78	26	483758.72	2676454.03	79	26	416536.77	2212885.59
79	27	413467.70	2192695.31	80	27	352183.05	1796348.82
80	28	349447.29	1779227.61	81	28	296533.58	1444165.77
81	29	293954.13	1429780.32	82	29	246009.44	1147632.19
82	30	243591.66	1135826.19	83	30	202242.35	901622.75
83	31	200199.13	892234.53	84	31	164243.99	699380.40
84	32	162567.73	692035.40	85	32	132129.06	535136.41
85	33	130790.56	529467.67	86	33	104217.85	403007.35
86	34	103170.34	398677.11	87	34	80397.055	298789.503
87	35	79580.766	295506.769	88	35	60264.842	218392.448
88	36	59646.684	215926.003	89	36	44961.060	158127.606
89	37	44486.627	156279.319	90	37	33720.880	113166.546
90	38	33354.837	111792.692	91	38	23829.747	79445.666
91	39	23563.647	78437.855	92	39	16262.006	55615.919
92	40	16068.863	54874.208	93	40	11178.340	39353.913
93	41	11032.966	38805.345	94	41	7896.2006	28175.5733
94	42	7787.4288	27772.3788	95	42	5643.0642	20279.3727
95	43	5561.9595	19984.9500	96	43	4119.9700	14636.3085
96	44	4059.8924	14422.9905	97	44	3069.8619	10516.3385
97	45	3024.4346	10363.0981	98	45	2272.7904	7446.4766
98	46	2239.1337	7338.6635	99	46	1699.8254	5173.6862
99	47	1674.6401	5099.5298	100	47	1323.8261	3473.8608
100	48	1304.4939	3424.8897	101	48	980.29602	2150.03474
101	49	966.63562	2120.39578	102	49	667.10533	1169.73872
102	50	657.97716	1153.76016	103	50	381.43600	502.63339
103	51	376.31780	495.78300	104	51	121.19739	121.19739
104	52	119.46520	119.46520				

Difference of Age 53 years.

COMMUTATION TABLES

FOR

JOINT ANNUITIES.

TABLE XXXVII.

CARLISLE MORTALITY, FOUR PER CENT.

CARLISLE 4 PER CENT.
COMMUTATION TABLES FOR JOINT ANNUITIES.

Equal Ages.

AGES.		D _{x,y}	N _{x,y}	AGES.		D _{x,y}	N _{x,y}
(x)	(y)			(x)	(y)		
0	0	100000000.	989565213.	54	54	2064569.7	20224442.4
1	1	68835116.	889565213.	55	55	1918647.3	18159872.7
2	2	55947523.	820730097.	56	56	1779315.6	16241225.4
3	3	47037754.	764782574.	57	57	1646484.5	14461909.8
4	4	41861474.	717744820.	58	58	1517682.9	12815425.3
5	5	37972382.	675883346.	59	59	1389517.0	11297742.4
6	6	35223509.	637910964.	60	60	1261589.3	9908225.4
7	7	33041862.	602687455.	61	61	1133178.6	8646636.1
8	8	31214571.	569645593.	62	62	1013007.2	7513457.5
9	9	29620389.	538431022.	63	63	902534.32	6500450.29
10	10	28192373.	508810633.	64	64	802703.28	5597915.97
11	11	26865213.	480618260.	65	65	711658.14	4795212.69
12	12	25583495.	453753047.	66	66	629211.52	4083554.55
13	13	24354134.	428169552.	67	67	554675.91	3454343.03
14	14	23175360.	403815418.	68	68	487044.75	2899667.12
15	15	22038448.	380640058.	69	69	425816.35	2412622.37
16	16	20929265.	358601610.	70	70	370212.06	1986806.02
17	17	19855203.	337672345.	71	71	320154.03	1616593.96
18	18	18828446.	317817142.	72	72	272674.10	1296439.93
19	19	17853053.	298988696.	73	73	227678.66	1023765.83
20	20	16926525.	281135643.	74	74	186054.63	796087.17
21	21	16046481.	264209118.	75	75	148091.17	610032.54
22	22	15215722.	248162637.	76	76	116490.76	461941.37
23	23	14426561.	232946915.	77	77	90130.497	345450.611
24	24	13676973.	218520354.	78	78	69043.233	255320.114
25	25	12965027.	204843381.	79	79	52725.120	186276.881
26	26	12284677.	191878354.	80	80	39402.035	133551.761
27	27	11638765.	179593677.	81	81	29224.724	94149.726
28	28	11017930.	167954912.	82	82	21083.474	64925.002
29	29	10410655.	156936982.	83	83	14969.556	43841.528
30	30	9814450.3	146526326.6	84	84	10377.932	28871.972
31	31	9247254.8	136711876.3	85	85	7061.3245	18494.0396
32	32	8711024.0	127464621.5	86	86	4618.1170	11432.7151
33	33	8207142.5	118753597.5	87	87	2888.5699	6814.5981
34	34	7733643.4	110546455.0	88	88	1706.2478	3926.0282
35	35	7285959.0	102812811.6	89	89	998.59628	2219.78041
36	36	6862746.5	95526852.6	90	90	590.98456	1221.18413
37	37	6460266.9	88664106.1	91	91	310.70247	630.19957
38	38	6077668.1	82203839.2	92	92	152.42468	319.49710
39	39	5714125.6	76126171.1	93	93	75.97784	167.07243
40	40	5364614.5	70412045.5	94	94	40.08538	91.09459
41	41	5024989.2	65047431.0	95	95	21.68080	51.00920
42	42	4699521.5	60022441.8	96	96	12.25336	29.32841
43	43	4389812.4	55322920.3	97	97	7.21624	17.07505
44	44	4098770.1	50933107.9	98	98	4.19748	9.85881
45	45	3825347.9	46834337.8	99	99	2.49164	5.66133
46	46	3570087.6	43008989.9	100	100	1.60380	3.16969
47	47	3331807.3	39438902.3	101	101	.93289	1.56589
48	48	3110775.9	36107095.0	102	102	.45766	.63300
49	49	2908348.9	32996319.1	103	103	.15842	.17534
50	50	2720482.7	30087970.2	104	104	.01693	.01693
51	51	2546119.5	27367487.5				
52	52	2378711.3	24821368.0				
53	53	2218214.3	22442656.7				

Equal Ages.

COMMUTATION TABLES FOR JOINT ANNUITIES

Difference of Age 1 year.

AGES.		D_{xy}	N_{xy}	AGES.		D_{xy}	N_{xy}
(x)	(y)			(x)	(y)		
1	0	81355769.	918976895.	55	54	1951621.9	18788194.5
2	1	60852551.	837621126.	56	55	1811788.1	16836572.6
3	2	50303366.	776768575.	57	56	1678373.6	15024784.5
4	3	43512484.	726465209.	58	57	1550074.9	13346410.9
5	4	30095296.	682952725.	59	58	1423086.2	11796336.0
6	5	35861922.	643857429.	60	59	1298297.6	10372349.8
7	6	33452756.	607995307.	61	60	1172442.3	9074052.2
8	7	31491567.	574542751.	62	61	1050603.3	7901609.9
9	8	29816550.	543051184.	63	62	937698.33	6851006.63
10	9	28336390.	513234634.	64	63	834627.53	5913398.30
11	10	26986359.	484898244.	65	64	741133.69	5078770.77
12	11	25707415.	457911885.	66	65	656171.50	4337637.08
13	12	24476517.	432204470.	67	66	579297.05	3681465.58
14	13	23296084.	407727953.	68	67	509668.06	3102168.53
15	14	22160884.	384431869.	69	68	446559.09	2592500.47
16	15	21050634.	362270985.	70	69	389331.72	2145941.38
17	16	19989296.	341211351.	71	70	337588.86	1756609.66
18	17	18959538.	321222055.	72	71	289724.19	1419020.80
19	18	17978225.	302262517.	73	72	244324.17	1129296.61
20	19	17046039.	284284292.	74	73	201820.25	884972.44
21	20	16160587.	267238253.	75	74	162767.67	683152.19
22	21	15322143.	251077666.	76	75	128793.41	520384.52
23	22	14528173.	235755523.	77	76	100476.60	391591.11
24	23	13773989.	221227350.	78	77	77353.466	291114.510
25	24	13057650.	207453361.	79	78	59163.340	213761.044
26	25	12375191.	194395711.	80	79	44694.228	154597.704
27	26	11725157.	182020520.	81	80	33274.984	109903.476
28	27	11104187.	170295363.	82	81	24340.507	76628.492
29	28	10502009.	159191176.	83	82	17420.430	52287.985
30	29	9911864.2	148689166.8	84	83	12222.026	34867.555
31	30	9341631.5	138777302.6	85	84	8394.2487	22645.5288
32	31	8800844.6	129435671.1	86	85	5599.6241	14251.2801
33	32	8291133.7	120634826.5	87	86	3581.4364	8651.6560
34	33	7812164.8	112343692.8	88	87	2176.9368	5070.2196
35	34	7360693.8	104531528.0	89	88	1279.9687	2893.2828
36	35	6933869.8	97170834.2	90	89	753.29722	1613.31412
37	36	6529163.3	90236964.4	91	90	420.18809	860.01690
38	37	6144365.7	83707801.1	92	91	213.39456	439.82881
39	38	5778654.3	77563435.4	93	92	105.52477	226.43425
40	39	5429095.6	71784781.1	94	93	54.11527	120.90948
41	40	5091199.9	66355685.5	95	94	28.90773	66.79421
42	41	4765162.6	61264485.6	96	95	15.98264	37.88648
43	42	4453824.9	56499323.0	97	96	9.22075	21.90385
44	43	4150423.0	52045498.1	98	97	5.39676	12.68309
45	44	3882805.0	47886075.1	99	98	3.17117	7.28633
46	45	3623750.1	44003270.1	100	99	1.96020	4.11516
47	46	3381915.1	40379520.0	101	100	1.19943	2.15495
48	47	3156876.8	36997604.9	102	101	.64072	.95553
49	48	2949449.3	33840728.1	103	102	.26403	.31481
50	49	2758224.2	30891278.8	104	103	.05078	.05078
51	50	2580748.6	28133054.6	Difference of Age 104 years.			
52	51	2413201.5	25552306.0				
53	52	2252454.1	23139104.5				
54	53	2098455.9	20886504.4	104	0	169.25160	169.25160

Difference of Age 104 years.

COMMUTATION TABLES FOR JOINT ANNUITIES.

Difference of Age 2 years.

AGES.		D _{x,y}	N _{x,y}	AGES.		D _{x,y}	N _{x,y}
(x)	(y)			(x)	(y)		
2	0	71921228.	864365502.	56	54	1842926.1	17411595.7
3	1	54713560.	792444274.	57	55	1709004.0	15568669.6
4	2	46533353.	737730714.	58	56	1580096.7	13859665.6
5	3	40637208.	691197361.	59	57	1454378.4	12279568.9
6	4	36922426.	650560153.	60	58	1330504.0	10825190.5
7	5	34059074.	613637727.	61	59	1206556.8	9494686.5
8	6	31883182.	579578653.	62	60	1087005.9	8288129.7
9	7	30081140.	547695471.	63	61	972406.15	7201123.79
10	8	28524048.	517614331.	64	62	867062.56	6228717.64
11	9	27124215.	489090283.	65	63	770609.27	5361655.08
12	10	25823340.	461966068.	66	64	683348.92	4591045.81
13	11	24595075.	436142728.	67	65	604118.34	3907696.89
14	12	23413149.	411547653.	68	66	532291.37	3303578.55
15	13	22276324.	388134504.	69	67	467301.83	2771287.18
16	14	21176632.	365858180.	70	68	408297.19	2303985.35
17	15	20113810.	344681548.	71	69	355023.69	1895688.16
18	16	19087581.	324567738.	72	70	305501.87	1540664.47
19	17	18103397.	305480157.	73	71	259601.56	1235162.60
20	18	17165553.	287376760.	74	72	216575.27	975561.04
21	19	16274693.	270211207.	75	73	176560.04	758985.77
22	20	15431098.	253936514.	76	74	141557.42	582425.73
23	21	14629786.	238505416.	77	75	111087.99	440868.31
24	22	13871005.	223875630.	78	76	86232.892	329780.323
25	23	13150274.	210004625.	79	77	66284.402	243547.431
26	24	12463601.	196854351.	80	78	50151.803	177263.029
27	25	11811548.	184390750.	81	79	37744.237	127111.226
28	26	11186611.	172579202.	82	80	27713.863	89366.989
29	27	10584227.	161392591.	83	81	20111.587	61653.126
30	28	9998840.9	150808363.7	84	82	14223.064	41541.539
31	29	9434352.3	140809522.8	85	83	9885.8543	27318.4748
32	30	8890665.3	131375170.5	86	84	6656.6318	17432.6205
33	31	8376624.8	122484505.2	87	85	4342.6136	10775.9887
34	32	7892113.8	114107880.4	88	86	2699.1074	6433.3751
35	33	7435428.6	106215766.6	89	87	1633.0635	3734.2677
36	34	7004993.0	98780338.0	90	88	965.55224	2101.20421
37	35	6596829.5	91775345.0	91	89	535.59187	1135.65197
38	36	6209893.1	85178515.5	92	90	288.59073	600.06010
39	37	5842070.5	78968622.4	93	91	147.73468	311.46937
40	38	5490405.5	73126551.9	94	92	75.16010	163.73469
41	39	5152394.7	67636146.4	95	93	39.02544	88.57460
42	40	4827949.8	62483751.7	96	94	21.31019	49.54916
43	41	4516034.2	57655801.9	97	95	12.02707	28.23898
44	42	4220075.9	53139767.7	98	96	6.89586	16.21191
45	43	3940262.0	48919691.8	99	97	4.07722	9.31605
46	44	3678179.1	44979429.8	100	98	2.49480	5.23882
47	45	3432749.1	41301250.7	101	99	1.46596	2.74402
48	46	3204353.8	37868501.6	102	100	.82378	1.27805
49	47	2993159.4	34664147.8	103	101	.36965	.45427
50	48	2797203.1	31670988.4	104	102	.08463	.08463
51	49	2616551.6	28873785.3	Difference of Age 103 years.			
52	50	2446022.9	26257233.7	103	0	528.06490	671.26868
53	51	2285113.6	23811210.8	104	1	143.20378	143.20378
54	52	2130847.2	21526097.2				
55	53	1983654.3	19395250.0				

Difference of Age 103 years.

COMMUTATION TABLES FOR JOINT ANNUITIES.

Difference of Age 3 years.

AGES.		D _{x,y}	N _{x,y}	AGES.		D _{x,y}	N _{x,y}
(x)	(y)			(x)	(y)		
3	0	64665595.	817116020.	57	54	1738375.5	16093465.2
4	1	50613023.	752450425.	58	55	1608933.5	14355089.7
5	2	43458461.	701837402.	59	56	1482546.8	12746156.2
6	3	38378641.	658378941.	60	57	1358901.0	11263609.4
7	4	35066265.	620000300.	61	58	1236487.4	9904708.4
8	5	32461053.	584934035.	62	59	1118634.4	8668221.0
9	6	30455216.	552472982.	63	60	1006099.3	7549586.6
10	7	28777169.	522017766.	64	61	899242.2	6543487.3
11	8	27303846.	493240597.	65	62	800556.44	5644245.15
12	9	25955255.	465936751.	66	63	710526.33	4843688.71
13	10	24705984.	439981496.	67	64	629139.81	4133162.38
14	11	23526557.	415275512.	68	65	555098.59	3504022.57
15	12	22388265.	391748955.	69	66	488044.56	2948923.98
16	13	21286945.	369360690.	70	67	427262.65	2460879.42
17	14	20225553.	348073745.	71	68	372317.91	2033616.77
18	15	19206478.	327848192.	72	69	321279.56	1661298.86
19	16	18225658.	308641714.	73	70	273738.85	1340019.30
20	17	17285067.	290416056.	74	71	230117.53	1066280.45
21	18	16388799.	273130989.	75	72	189468.29	836162.92
22	19	15540054.	256742190.	76	73	153552.50	646694.63
23	20	14733818.	241202136.	77	74	122097.31	493142.13
24	21	13968022.	226468318.	78	75	95339.997	371044.823
25	22	13242897.	212500296.	79	76	73893.207	275704.826
26	23	12552010.	199257399.	80	77	56188.211	201811.619
27	24	11895931.	186705389.	81	78	42353.154	145623.408
28	25	11269035.	174809458.	82	79	31436.187	103270.254
29	26	10662791.	163540423.	83	80	22898.855	71834.067
30	27	10077120.	152877632.	84	81	16420.282	48935.212
31	28	9517138.8	142800512.4	85	82	11504.405	32514.930
32	29	8978910.1	133283373.6	86	83	7839.4738	21010.5249
33	30	8462115.9	124304463.5	87	84	5162.3429	13171.0511
34	31	7973490.5	115842347.6	88	85	3272.7597	8008.7082
35	32	7511522.1	107868857.1	89	86	2024.7781	4735.9485
36	33	7076116.3	100357335.0	90	87	1231.9115	2711.1704
37	34	6664495.5	93281218.7	91	88	686.50449	1479.25894
38	35	6274250.4	86616723.2	92	89	367.85157	792.75445
39	36	5904373.9	80342472.8	93	90	199.79357	424.90288
40	37	5550658.3	74438098.9	94	91	105.22413	225.10931
41	38	5210579.8	68887440.6	95	92	54.20199	119.88518
42	39	4885980.3	63676860.8	96	93	28.76875	65.68319
43	40	4575538.7	58790880.5	97	94	16.03609	36.91444
44	41	4279020.3	54215341.8	98	95	8.99460	20.87835
45	42	3997719.2	49936321.5	99	96	5.20979	11.88374
46	43	3732608.2	45938602.3	100	97	3.20761	6.67396
47	44	3484309.4	42205994.1	101	98	1.86577	3.46635
48	45	3252518.8	38721684.7	102	99	1.00684	1.60058
49	46	3038174.2	35469165.9	103	100	.47526	.59373
50	47	2838656.9	32430991.7	104	101	.11848	.11848
51	48	2653528.4	29592334.8	Difference of Age 103 years.			
52	49	2479956.8	26938806.4				
53	50	2316192.9	24458849.6				
54	51	2161743.5	22142656.7	102	0	915.31240	1493.76894
55	52	2014273.5	19980913.2	103	1	446.79572	578.45654
56	53	1873174.5	17966639.7	104	2	131.66082	131.66082

Difference of Age 103 years.

COMMUTATION TABLES FOR JOINT ANNUITIES.

Difference of Age 4 years.

AGES.		D _{xy}	N _{xy}	AGES.		D _{xy}	N _{xy}
(x)	(y)			(x)	(y)		
4	0	59819197.	775557712.	58	54	1636585.2	14832677.4
5	1	47268548.	715738515.	59	55	1509603.3	13196092.2
6	2	41043092.	668469967.	60	56	1385220.2	11686488.9
7	3	36449273.	627426875.	61	57	1262877.8	10301268.7
8	4	33420987.	590977602.	62	58	1146383.9	9038390.9
9	5	31007205.	557556615.	63	59	1035373.7	7892007.0
10	6	29135029.	526549410.	64	60	930400.27	6856633.35
11	7	27546138.	497414381.	65	61	830267.81	5926233.08
12	8	26127144.	469868243.	66	62	738138.60	5095965.27
13	9	24832191.	443741099.	67	63	654161.27	4357826.67
14	10	23632648.	418908908.	68	64	578089.76	3703665.40
15	11	22496708.	395276260.	69	65	508955.94	3125575.64
16	12	21393914.	372779552.	70	66	446228.11	2616619.70
17	13	20330911.	351385638.	71	67	389612.13	2170391.59
18	14	19313181.	331054727.	72	68	336930.02	1780779.46
19	15	18339187.	311741546.	73	69	287876.13	1443849.44
20	16	17401801.	293402359.	74	70	242649.19	1155973.31
21	17	16502905.	276000558.	75	71	201315.58	913324.12
22	18	15649009.	259497653.	76	72	164778.68	712008.54
23	19	14837850.	243848644.	77	73	132443.42	547229.86
24	20	14067348.	229010794.	78	74	104788.62	414786.44
25	21	13335520.	214943446.	79	75	81697.11	309997.82
26	22	12640419.	201607926.	80	76	62638.072	228300.713
27	23	11980313.	188967507.	81	77	47450.895	165662.641
28	24	11349541.	176987194.	82	78	35274.834	118211.746
29	25	10741355.	165637653.	83	79	25974.462	82936.912
30	26	10151920.	154896298.	84	80	18695.972	56962.450
31	27	9591646.7	144744378.3	85	81	13281.637	38266.478
32	28	9057700.1	135152731.6	86	82	9122.9831	24984.8407
33	29	8546107.1	126095031.5	87	83	6079.6590	15861.8576
34	30	8054867.3	117548924.4	88	84	3890.5391	9782.1986
35	31	7588974.5	109494057.1	89	85	2455.1124	5891.6595
36	32	7148532.6	101905082.6	90	86	1527.4038	3436.5471
37	33	6732161.7	94756550.0	91	87	875.88505	1909.14335
38	34	6338607.7	88024388.3	92	88	471.50035	1033.25830
39	35	5965564.9	81685780.6	93	89	254.66646	561.75795
40	36	5609854.1	75720215.7	94	90	142.30311	307.09149
41	37	5267761.7	70110361.6	95	91	75.88279	164.78838
42	38	4941156.8	64842599.9	96	92	39.95660	88.90559
43	39	4630535.3	59901443.1	97	93	21.64873	48.94900
44	40	4335401.9	55270907.8	98	94	11.99280	27.30027
45	41	4053557.7	50935505.9	99	95	6.79537	15.30747
46	42	3787037.3	46881948.2	100	96	4.09861	8.51209
47	43	3535869.6	43094910.9	101	97	2.39885	4.41349
48	44	3301372.0	39559041.3	102	98	1.28144	2.01464
49	45	3083841.4	36257669.3	103	99	.58087	.73320
50	46	2881348.2	33173827.9	104	100	.15233	.15233
51	47	2692853.0	30292479.7	Difference of Age 101 years.			
52	48	2515003.6	27599626.7	101	0	1332.69490	2641.03601
53	49	2348325.6	25084623.4	102	1	774.44582	1308.34111
54	50	2191144.8	22736297.8	103	2	410.78168	533.89529
55	51	2043479.5	20545153.0	104	3	123.11361	123.11361
56	52	1902088.3	18501673.5				
57	53	1766907.8	16599585.2				

Difference of Age 101 years.

COMMUTATION TABLES FOR JOINT ANNUITIES.

Difference of Age 5 years.

AGES.		D _{xy}	N _{xy}	AGES.		D _{xy}	N _{xy}
(x)	(y)			(x)	(y)		
5	0	55866385.	737525580.	59	54	1535547.8	13629427.0
6	1	44641419.	681659195.	60	55	1410500.4	12093879.2
7	2	38979776.	637017776.	61	56	1287337.2	10683378.8
8	3	34739105.	598038000.	62	57	1170851.3	9396041.6
9	4	31924146.	563298895.	63	58	1061057.8	8225190.3
10	5	29663090.	531374749.	64	59	957472.04	7164132.51
11	6	27888689.	501711659.	65	60	859035.97	6206860.47
12	7	26358995.	473822970.	66	61	765533.43	5347624.50
13	8	24996643.	447463975.	67	62	679583.09	4582091.07
14	9	23753372.	422467332.	68	63	601080.92	3902507.98
15	10	22598155.	398713960.	69	64	530035.96	3301427.06
16	11	21497541.	376115805.	70	65	465347.78	2771391.10
17	12	20433076.	354618264.	71	66	406906.35	2306043.32
18	13	19413786.	334185188.	72	67	352580.46	1899136.97
19	14	18441071.	314771402.	73	68	301899.40	1546556.51
20	15	17510198.	296330331.	74	69	255180.84	1244657.11
21	16	16614357.	278820133.	75	70	212278.75	989476.27
22	17	15757964.	262205776.	76	71	175082.15	777197.52
23	18	14941881.	246447812.	77	72	142126.31	602115.37
24	19	14166674.	231505931.	78	73	113668.04	459989.06
25	20	13430348.	217339257.	79	74	89793.659	346321.018
26	21	12728829.	203908909.	80	75	69253.313	256527.359
27	22	12064696.	191180080.	81	76	52897.797	187274.046
28	23	11430048.	179115384.	82	77	39520.609	134376.249
29	24	10818092.	167685336.	83	78	29146.183	94855.640
30	25	10226720.	156867244.	84	79	21207.079	65709.457
31	26	9662843.2	146640524.4	85	80	15122.342	44502.378
32	27	9128611.1	136977681.2	86	81	10532.327	29380.036
33	28	8621099.2	127849070.1	87	82	7075.0446	18847.7091
34	29	8134816.4	119227970.9	88	83	4581.8636	11772.6645
35	30	7666426.8	111093154.5	89	84	2918.5493	7190.8009
36	31	7222242.1	103426727.7	90	85	1852.0291	4272.2516
37	32	6801058.0	96204485.6	91	86	1085.9791	2420.2225
38	33	6402965.1	89403427.6	92	87	601.56941	1334.24344
39	34	6026755.9	83000462.5	93	88	326.42330	732.67403
40	35	5667992.7	76973706.6	94	89	181.38636	406.25073
41	36	5323940.4	71305713.9	95	90	102.62244	224.86437
42	37	4995382.1	65981773.5	96	91	55.93924	122.24193
43	38	4682827.2	60986391.4	97	92	30.06767	66.30270
44	39	4387512.1	56303564.2	98	93	16.19029	36.23502
45	40	4106968.6	51916052.1	99	94	9.06050	20.04474
46	41	3839933.2	47809083.5	100	95	5.34601	10.98424
47	42	3587429.8	43969150.3	101	96	3.06520	5.63823
48	43	3350225.1	40381720.5	102	97	1.64756	2.57303
49	44	3130161.0	37031495.4	103	98	.73929	.92547
50	45	2924658.1	33901334.4	104	99	.18618	.18618
51	46	2733351.5	30976676.3	Difference of Age 100 years.			
52	47	2552274.9	28243324.8	100	0	1782.0034	4124.17479
53	48	2381511.9	25691049.9	101	1	1127.5932	2342.17139
54	49	2221542.7	23309538.0	102	2	712.02152	1214.57819
55	50	2071272.4	21087995.3	103	3	384.11441	502.55667
56	51	1929667.7	19016722.9	104	4	118.44226	118.44226
57	52	1794181.4	17087055.2				
58	53	1663446.8	15292873.8				

Difference of Age 100 years.

COMMUTATION TABLES FOR JOINT ANNUITIES.

Difference of Age 6 years.

AGES.		D _{xy}	N _{xy}	AGES.		D _{xy}	N _{xy}
(x)	(y)			(x)	(y)		
6	0	52761398.	702323787.	60	54	1434741.8	12485862.6
7	1	42397209.	649562389.	61	55	1310831.1	11051120.8
8	2	37150880.	607165180.	62	56	1193528.3	9740289.7
9	3	33183229.	570014300.	63	57	1083704.0	8546761.4
10	4	30540283.	536831071.	64	58	981223.67	7463057.41
11	5	28394162.	506290788.	65	59	884031.25	6481833.74
12	6	26686783.	477896626.	66	60	792058.58	5597802.49
13	7	25218461.	451209843.	67	61	704804.72	4805743.91
14	8	23910679.	425991382.	68	62	624439.95	4100939.19
15	9	22713594.	402080703.	69	63	551115.98	3476499.24
16	10	21594482.	379367109.	70	64	484621.62	2925383.26
17	11	20532049.	357772627.	71	65	424341.18	2440761.64
18	12	19511343.	337240578.	72	66	368230.91	2016420.46
19	13	18537133.	317729235.	73	67	315922.67	1648189.55
20	14	17607477.	299192102.	74	68	267611.43	1332266.88
21	15	16717849.	281584625.	75	69	223241.91	1064655.45
22	16	15864385.	264866776.	76	70	184616.71	841413.54
23	17	15045913.	249002391.	77	71	151013.35	656796.83
24	18	14266000.	233956478.	78	72	121978.28	505783.48
25	19	13525177.	219690478.	79	73	97402.465	383805.202
26	20	12819343.	206165301.	80	74	76116.627	286402.737
27	21	12149078.	193345958.	81	75	58484.364	210286.110
28	22	11510555.	181196880.	82	76	44057.191	151801.746
29	23	10894829.	169686325.	83	77	32654.297	107744.555
30	24	10299780.	158791496.	84	78	23796.657	75090.258
31	25	9734039.6	148491715.9	85	79	17153.465	51293.601
32	26	9196370.5	138757676.3	86	80	11992.004	34140.136
33	27	8688592.2	129561305.8	87	81	8168.017	22148.132
34	28	8206199.5	120872713.6	88	82	5332.0242	13980.1152
35	29	7742520.4	112666514.1	89	83	3437.1573	8648.0910
36	30	7295951.7	104923993.7	90	84	2201.6256	5210.9337
37	31	6871184.7	97628042.0	91	85	1316.7866	3009.3081
38	32	6468492.4	90756857.3	92	86	745.86478	1692.52147
39	33	6087946.9	84288364.9	93	87	416.47111	946.65669
40	34	5726131.5	78200418.0	94	88	232.49523	530.18558
41	35	5379116.0	72474286.5	95	89	130.80748	297.69035
42	36	5048656.0	67095170.5	96	90	75.65116	166.88287
43	37	4734217.5	62046514.5	97	91	42.09474	91.23171
44	38	4437059.6	57312297.0	98	92	22.48651	49.13697
45	39	4156333.1	52875237.4	99	93	12.23167	26.65046
46	40	3890529.2	48718904.3	100	94	7.12801	14.41879
47	41	3637537.6	44828375.1	101	95	3.99808	7.29077
48	42	3399078.3	41190837.5	102	96	2.10522	3.29269
49	43	3176480.6	37791759.2	103	97	.95052	1.18747
50	44	2968586.7	34615278.6	104	98	.23695	.23695
51	45	2774436.8	31646691.9	Difference of Age 99 years.			
52	46	2590659.2	28872255.1	99	0	2265.1244	5959.9593
53	47	2416805.3	26281595.9	100	1	1507.7531	3694.8349
54	48	2252937.4	23864790.6	101	2	1036.7034	2187.0818
55	49	2100007.3	21611853.2	102	3	665.79824	1150.37836
56	50	1955912.6	19511845.9	103	4	869.53981	484.58012
57	51	1820196.2	17555933.3	104	5	115.04031	115.04031
58	52	1689123.4	15735737.1				
59	53	1560751.1	14046613.7				

Difference of Age 99 years.

COMPUTATION TABLES FOR JOINT ANNUITIES.

Difference of Age 7 years.

AGES.		D_{xy}	N_{xy}	AGES.		D_{xy}	N_{xy}
x	y			x	y		
7	1	50106981	460222257	41	54	1333359.5	11404608.0
8	1	48407749	419114274	42	55	1215310.2	10071243.5
9	1	46446947	374776307	43	56	1046593.2	8855933.3
10	1	44144747	324219330	44	57	802166.0	7751240.1
11	1	41233939	271147433	45	58	596871.08	6749074.14
12	1	37770471	212240708	46	59	415705.02	5843113.06
13	1	34583047	155970222	47	60	259225.69	5029008.04
14	1	31622960	102538165	48	61	145715.03	4298782.35
15	1	28964014	65415306	49	62	77533.27	3651167.32
16	1	26704704	392561229	50	63	50896.48	3078634.06
17	10	24624637	360444205	51	64	441916.61	2574738.57
18	11	14606251	34221452	52	65	384008.60	2132821.96
19	12	14639295	320615007	53	66	329445.96	1748813.36
20	13	17499197	301965722	54	67	280462.02	1418867.41
21	14	16910726	284296525	55	68	234116.67	1138825.39
22	15	15932906	267475779	56	69	194151.26	904708.72
23	16	15147528	251512594	57	70	159237.13	710557.46
24	17	14265228	236395952	58	71	129916.48	551320.28
25	18	13639006	221997742	59	72	104523.53	421714.80
26	19	12809657	208379737	60	73	82566.429	317191.274
27	20	12235470	195486880	61	74	64280.426	234624.785
28	21	11591082	183234410	62	75	48710.095	170344.359
29	22	10971566	171643348	63	76	36492.693	121634.264
30	23	10272641	160671782	64	77	26990.888	85231.571
31	24	9603591.2	15022941.2	65	78	19248.069	58570.683
32	25	9264129.9	140495361.0	66	79	13992.682	39322.624
33	26	8739665.5	131231231.1	67	80	9300.9241	25719.9417
34	27	8270444.3	12247145.6	68	81	6156.7301	16419.9176
35	28	7810461.1	114267701.3	69	82	3999.2022	10264.1875
36	29	7369292.1	106297240.2	70	83	2592.8407	6264.2853
37	30	6941311.4	99729872.1	71	84	1565.3486	3671.4446
38	31	6525190.0	9267560.7	72	85	904.38645	2106.09602
39	32	6129250.5	85562370.7	73	86	516.36790	1201.70957
40	33	574270.1	79402120.2	74	87	296.63184	685.34167
41	34	5434291.5	73617850.1	75	88	167.66483	388.70983
42	35	5100778.6	68183558.6	76	89	96.42859	221.04500
43	36	4784706.2	63082580.0	77	90	56.92813	124.61641
44	37	4485752.3	58297873.8	78	91	31.48111	67.68828
45	38	4203269.9	53812121.0	79	92	16.98843	36.20717
46	39	3937272.2	49608851.1	80	93	9.62282	19.21874
47	40	3685466.9	45671558.9	81	94	5.33078	9.59592
48	41	3446555.3	41986092.0	82	95	2.74594	4.26514
49	42	3222900.2	38539536.7	83	96	1.21455	1.51920
50	43	3012515.4	35316736.5	84	97	.30465	.30465
51	44	2816109.1	32304221.1	Difference of Age 98 years.			
52	45	2629509.8	29488112.0	98	0	2998.2011	8382.7993
53	46	2453152.2	26858512.2	99	1	1916.5218	5384.5982
54	47	2286325.3	24405360.0	100	2	1386.2204	3468.0764
55	48	2126684.4	22119034.7	101	3	969.40227	2081.85597
56	49	1983047.2	19989350.3	102	4	640.53562	1112.45370
57	50	1844952.2	18006303.1	103	5	358.92571	471.91808
58	51	1713614.9	16161350.9	104	6	112.99237	112.99237
59	52	1584842.5	14447736.0				
60	53	1458290.5	12862893.5				

Difference of Age 98 years.

COMMUTATION TABLES FOR JOINT ANNUITIES.

Difference of Age 8 years.

AGES.		D _{x,y}	N _{s,y}	AGES.		D _{x,y}	N _{s,y}
(x)	(y)			(x)	(y)		
8	0	47757912.	637855543.	62	54	1236197.0	10389025.2
9	1	38598199.	590097631.	63	55	1124853.8	9152828.2
10	2	33948680.	551499432.	64	56	1021575.9	8027974.4
11	3	30386808.	517550752.	65	57	925297.05	7006398.55
12	4	27973953.	487163944.	66	58	835325.03	6081101.50
13	5	25994826.	459189991.	67	59	750443.89	5245776.47
14	6	24422841.	433195165.	68	60	670054.40	4495332.58
15	7	23066909.	408772324.	69	61	593781.93	3825278.18
16	8	21848535.	385705415.	70	62	523477.69	3231496.25
17	9	20729995.	363856880.	71	63	459492.05	2708018.56
18	10	19694261.	343126885.	72	64	399913.53	2248526.51
19	11	18720525.	323432624.	73	65	344083.23	1848612.98
20	12	17788138.	304712099.	74	66	292472.62	1504529.75
21	13	16898295.	286923961.	75	67	244991.42	1212057.13
22	14	16051890.	270025666.	76	68	203608.93	967065.71
23	15	15241880.	253973776.	77	69	167461.00	763456.78
24	16	14462342.	238731896.	78	70	136663.48	595995.78
25	17	13714833.	224269554.	79	71	111059.30	459332.30
26	18	13000371.	210554721.	80	72	88602.896	348273.001
27	19	12321862.	197554350.	81	73	69727.327	259670.105
28	20	11673486.	185232488.	82	74	53537.484	189942.778
29	21	11048303.	173559002.	83	75	40247.202	136405.294
30	22	10445901.	162510699.	84	76	29721.298	96158.092
31	23	9873120.9	152064797.7	85	77	21564.808	66436.794
32	24	9330313.6	142191676.8	86	78	15263.694	44871.986
33	25	8817578.7	132861363.2	87	79	10549.135	29608.292
34	26	8331833.8	124043784.5	88	80	7008.8539	19059.1573
35	27	7871607.7	115711950.7	89	81	4617.8181	12050.3034
36	28	7433025.6	107840343.0	90	82	3017.3507	7432.4853
37	29	7010207.7	100407317.4	91	83	1843.5013	4415.1346
38	30	6601887.6	93397109.7	92	84	1075.1021	2571.6333
39	31	6213666.6	86795222.1	93	85	626.11366	1496.53121
40	32	5843465.7	80581555.5	94	86	367.78340	870.41755
41	33	5489467.1	74738089.8	95	87	213.91720	502.63415
42	34	5153301.2	69248622.7	96	88	123.59907	288.71695
43	35	4834293.3	64095321.5	97	89	72.56332	165.11788
44	36	4533591.7	59261028.2	98	90	42.57446	92.55456
45	37	4249397.4	54727436.5	99	91	23.78381	49.98011
46	38	3981755.4	50478039.1	100	92	13.36503	26.19630
47	39	3729765.1	46496283.7	101	93	7.19655	12.83128
48	40	3491968.1	42766518.6	102	94	3.66125	5.63472
49	41	3267815.0	39274550.5	103	95	1.58419	1.97347
50	42	3056444.0	36006735.5	104	96	.38928	.38928
51	43	2857781.5	32950291.5	Difference of Age 97 years.			
52	44	2669096.6	30092510.0	97	0	4009.0232	11622.9690
53	45	2490025.9	27423413.4	98	1	2536.7779	7613.9458
54	46	2320709.9	24933387.5	99	2	1762.0403	5077.1679
55	47	2161245.8	22612677.6	100	3	1296.2293	3315.1276
56	48	2011071.4	20451431.8	101	4	932.61989	2018.89835
57	49	1870547.4	18440360.4	102	5	622.13784	1086.27846
58	50	1736921.3	16569813.0	103	6	352.53612	464.14062
59	51	1607822.0	14832891.7	104	7	111.60450	111.60450
60	52	1480800.3	13225069.7				
61	53	1355244.2	11744269.4				

Difference of Age 97 years.

COMMUTATION TABLES FOR JOINT ANNUITIES.

Difference of Age 9 years.

AGES.		D _{x,y}	N _{x,y}	AGES.		D _{x,y}	N _{x,y}
(x)	(y)			(x)	(y)		
9	0	45618957.	607982044.	63	54	1144185.9	9437584.4
10	1	36925027.	562363087.	64	55	1040219.7	8293398.5
11	2	32496422.	525438060.	65	56	943218.2	7253178.8
12	3	29077241.	492941638.	66	57	853153.42	6309960.60
13	4	26763542.	463864397.	67	58	769059.86	5456807.18
14	5	24865496.	437100855.	68	59	689550.90	4687747.32
15	6	23353759.	412235359.	69	60	614356.03	3998196.42
16	7	22042417.	388881600.	70	61	542905.74	3383840.39
17	8	20867279.	366839183.	71	62	477348.68	2840934.65
18	9	19794867.	345971904.	72	63	415818.47	2363585.97
19	10	18804944.	326177037.	73	64	358334.52	1947767.50
20	11	17874299.	307372093.	74	65	305004.27	1589432.98
21	12	16983211.	289497794.	75	66	255866.18	1284428.71
22	13	16135506.	272514583.	76	67	213066.59	1028562.53
23	14	15326557.	256379077.	77	68	175618.51	815495.94
24	15	14552429.	241052520.	78	69	143721.49	639877.43
25	16	13807456.	226500091.	79	70	117107.32	496155.94
26	17	13090885.	212692635.	80	71	94143.161	379048.619
27	18	12408253.	199601750.	81	72	74825.070	284905.458
28	19	11755909.	187193497.	82	73	58074.067	210080.388
29	20	11126867.	175437588.	83	74	44235.879	152006.321
30	21	10518961.	164310721.	84	75	32860.181	107770.442
31	22	9942661.7	153791760.0	85	76	24040.239	74910.261
32	23	9396497.2	143849098.3	86	77	17100.874	50870.022
33	24	8880572.2	134452601.1	87	78	11837.281	33769.148
34	25	8393223.2	125572028.9	88	79	7950.232	21931.867
35	26	7930036.8	117178805.7	89	80	5257.8025	13981.6350
36	27	7491217.3	109248768.9	90	81	3483.4794	8723.8325
37	28	7071722.4	101757551.6	91	82	2145.3265	5240.3531
38	29	6667415.0	94685829.2	92	83	1266.1410	3095.0266
39	30	6277082.6	88018414.2	93	84	744.30141	1828.88558
40	31	5903718.6	81741331.6	94	85	445.94989	1084.58417
41	32	5545645.8	75837613.0	95	86	265.22842	638.63428
42	33	5205623.9	70291967.2	96	87	157.69537	373.40586
43	34	4883380.4	65086343.3	97	88	93.00934	215.71050
44	35	4580576.3	60202462.9	98	89	54.26744	122.70116
45	36	4294715.7	55621886.6	99	90	32.16477	68.43372
46	37	4025452.0	51327170.9	100	91	18.71104	36.26895
47	38	3771884.7	47301718.9	101	92	9.99521	17.55791
48	39	3533940.5	43529834.2	102	93	4.94269	7.56270
49	40	3310872.7	39995893.7	103	94	2.11226	2.62001
50	41	3099135.3	36685021.0	104	95	.50775	.50775
51	42	2899453.8	33585885.7	Difference of Age 96 years.			
52	43	2708593.4	30686431.9	96	0	5327.5463	15922.3030
53	44	2527426.3	27977838.5	97	1	3392.0345	10594.7567
54	45	2355592.8	25450412.2	98	2	2332.3006	7202.7222
55	46	2193749.2	23094819.4	99	3	1647.6515	4870.4216
56	47	2040874.9	20901070.2	100	4	1247.0460	3222.7701
57	48	1896981.8	18860195.3	101	5	905.83272	1975.72411
58	49	1761017.8	16963213.5	102	6	611.06256	1069.89139
59	50	1629689.6	15202195.7	103	7	348.20599	458.82883
60	51	1502271.3	13572506.1	104	8	110.62234	110.62234
61	52	1376163.5	12070234.8				
62	53	1256486.9	10694071.3				

Difference of Age 96 years.

COMMUTATION TABLES FOR JOINT ANNUITIES.

Difference of Age 10 years.

AGES.		D _{x,y}	N _{x,y}	AGES.		D _{x,y}	N _{x,y}
(x)	(y)			(x)	(y)		
10	0	43641445.	579439460.	64	54	1058097.3	8547662.5
11	1	35345447.	535798015.	65	55	960431.93	7489565.24
12	2	31095939.	500452568.	66	56	869677.28	6529133.31
13	3	27819091.	469356629.	67	57	785473.94	5659456.03
14	4	25600815.	441537538.	68	58	706656.33	4873982.09
15	5	23777037.	415936723.	69	59	632231.89	4167325.76
16	6	22316527.	392159686.	70	60	561717.01	3535093.87
17	7	21052454.	369843159.	71	61	495064.71	2973376.86
18	8	19925959.	348790705.	72	62	431977.87	2478312.15
19	9	18901006.	328864746.	73	63	372585.82	2046334.28
20	10	17954901.	309963740.	74	64	317636.99	1673748.46
21	11	17065474.	292008839.	75	65	266829.34	1356111.47
22	12	16216589.	274943365.	76	66	222524.26	1089282.13
23	13	15406396.	258726776.	77	67	183776.02	866757.87
24	14	14633275.	243320380.	78	68	150722.57	682981.85
25	15	13893464.	228687105.	79	69	123155.34	532259.28
26	16	13179295.	214793641.	80	70	99269.974	409103.942
27	17	12494645.	201614346.	81	71	79503.819	309833.968
28	18	11838333.	189119701.	82	72	62319.841	230330.149
29	19	11205431.	177281368.	83	73	47984.275	168010.308
30	20	10593761.	166075937.	84	74	36116.773	120026.033
31	21	10012202.	155482176.	85	75	26579.143	83909.260
32	22	9462680.8	145469974.1	86	76	19063.888	57330.117
33	23	8943565.6	136007293.3	87	77	13262.049	38266.229
34	24	8453184.9	127063727.7	88	78	8921.0281	25004.1798
35	25	7988465.8	118610542.8	89	79	5963.9921	16083.1517
36	26	7546822.8	110622077.0	90	80	3966.2555	10119.1596
37	27	7127085.6	103075254.2	91	81	2476.7425	6152.9041
38	28	6725921.6	95948168.6	92	82	1473.4386	3676.1616
39	29	6339386.2	89222247.0	93	83	876.55913	2202.72303
40	30	5963971.4	82882860.8	94	84	530.12920	1326.16390
41	31	5602827.9	76918889.4	95	85	321.59850	796.03470
42	32	5258897.8	71316061.5	96	86	195.52095	474.43620
43	33	4933467.5	66057163.7	97	87	118.66709	278.91525
44	34	4627561.0	61123696.2	98	88	69.55826	160.24816
45	35	4339224.7	56496135.2	99	89	40.99875	90.68989
46	36	4068382.0	52156910.5	100	90	25.30445	49.69114
47	37	3813278.1	48088528.5	101	91	13.99330	24.38669
48	38	3573848.7	44275250.4	102	92	6.86484	10.39340
49	39	3350668.4	40701401.7	103	93	2.85155	3.52856
50	40	3139970.4	37350733.3	104	94	.67701	.67701
51	41	2939952.2	34210762.9	Difference of Age 95 years.			
52	42	2748090.3	31270810.7	95	0	7226.9325	21778.7442
53	43	2564826.7	28522720.4	96	1	4507.6369	14551.8117
54	44	2390974.0	25957893.7	97	2	3118.6191	10044.1748
55	45	2226723.8	23566919.7	98	3	2180.8915	6925.5557
56	46	2071568.1	21340195.9	99	4	1585.1341	4744.6642
57	47	1925094.6	19268627.8	100	5	1211.2277	3159.5301
58	48	1785904.3	17343533.2	101	6	889.70711	1948.30237
59	49	1652298.4	15557628.9	102	7	603.55699	1058.59526
60	50	1522703.3	13905330.5	103	8	345.14321	455.03827
61	51	1396117.2	12382627.2	104	9	109.89506	109.89506
62	52	1275881.8	10986510.0				
63	53	1162965.7	9710628.2				

Difference of Age 95 years.

COMMUTATION TABLES FOR JOINT ANNUITIES.

Difference of Age 11 years.

AGES.		D_{xy}	N_{xy}	AGES.		D_{xy}	N_{xy}
(x)	(y)			(x)	(y)		
11	0	41774550.	552103880.	65	54	976938.24	7715720.28
12	1	33822180.	510329330.	66	55	885548.89	6738782.04
13	2	29750442.	476507150.	67	56	800687.00	5853233.15
14	3	26610508.	446756708.	68	57	721738.54	5052546.15
15	4	24480168.	420146200.	69	58	647915.42	4330807.61
16	5	22721005.	395666032.	70	59	578061.24	3682892.19
17	6	21314253.	372945027.	71	60	512218.33	3104830.95
18	7	20102780.	351630774.	72	61	448010.03	2592612.62
19	8	19026178.	331527994.	73	62	387065.13	2144602.59
20	9	18046621.	312501816.	74	63	330269.69	1757537.46
21	10	17142429.	294455195.	75	64	277880.92	1427267.77
22	11	16295138.	277312766.	76	65	232058.82	1149386.85
23	12	15483815.	261017628.	77	66	191933.52	917328.03
24	13	14709502.	245533813.	78	67	157723.66	725394.51
25	14	13970650.	230824311.	79	68	129154.59	567670.85
26	15	13261389.	216853661.	80	69	104396.79	438516.26
27	16	12579028.	203592272.	81	70	83833.407	334119.467
28	17	11920756.	191013244.	82	71	66216.650	250286.060
29	18	11283995.	179092488.	83	72	51492.390	184069.410
30	19	10668561.	167808493.	84	73	39177.184	132577.020
31	20	10083399.	157139932.	85	74	29213.255	93399.836
32	21	9528864.4	147056532.6	86	75	21077.237	64186.581
33	22	9006559.0	137527668.2	87	76	14784.403	43109.344
34	23	8513146.7	128521109.2	88	77	9994.7875	28324.9415
35	24	8045535.9	120007962.5	89	78	6692.2502	18330.1540
36	25	7602428.2	111962426.6	90	79	4498.9740	11637.9038
37	26	7179988.3	104359998.4	91	80	2819.9947	7138.9298
38	27	6778577.5	97180010.1	92	81	1701.0594	4318.9351
39	28	6395014.4	90401432.6	93	82	1020.0728	2617.8757
40	29	6023167.1	84006418.2	94	83	624.32985	1597.80293
41	30	5660009.9	77983251.1	95	84	382.30473	973.47308
42	31	5313123.0	72323241.2	96	85	237.07581	591.16835
43	32	4983956.2	67010118.2	97	86	147.13115	354.09254
44	33	4674545.6	62026162.0	98	87	88.74675	206.96139
45	34	4383733.7	57351616.4	99	88	52.55089	118.21464
46	35	4110545.3	52967882.7	100	89	32.25426	65.66375
47	36	3853945.4	48857337.4	101	90	18.92427	33.40949
48	37	3613068.9	45003392.0	102	91	9.61078	14.48523
49	38	3388506.9	41390323.1	103	92	3.96049	4.87445
50	39	3177711.9	38001816.2	104	93	.91396	.91396
51	40	2978689.8	34824104.3	Difference of Age 94 years.			
52	41	2786474.5	31845414.5	94	0	10021.346	29953.1634
53	42	2602227.2	29058940.0	95	1	6114.7076	19931.8174
54	43	2426355.2	26456712.8	96	2	4144.2983	13817.1098
55	44	2260169.4	24030357.6	97	3	2916.1635	9672.8115
56	45	2102706.2	21770188.2	98	4	2098.1411	6756.6480
57	46	1954046.5	19667482.0	99	5	1539.6051	4658.5069
58	47	1812370.9	17713435.5	100	6	1189.6655	3118.9018
59	48	1675648.5	15901064.6	101	7	878.77901	1929.23627
60	49	1543827.9	14225416.1	102	8	598.24819	1050.45726
61	50	1415105.4	12681588.2	103	9	342.87254	452.20907
62	51	1294381.5	11266482.8	104	10	109.33653	109.33653
63	52	1180917.0	9972101.3				
64	53	1075464.0	8791184.3				

Difference of Age 94 years.

COMMUTATION TABLES FOR JOINT ANNUITIES.

Difference of Age 12 years.

AGES.		D _{x,y}	N _{x,y}	AGES.		D _{x,y}	N _{x,y}
(x)	(y)			(x)	(y)		
12	0	39974211.	525894903.	66	54	900768.24	6939081.87
13	1	32358720.	485920692.	67	55	815299.54	6038313.63
14	2	28457951.	453561972.	68	56	735717.16	5223014.09
15	3	25445662.	425104021.	69	57	661743.91	4487296.93
16	4	23392908.	399658359.	70	58	592400.97	3825553.02
17	5	21700566.	376265451.	71	59	527122.30	3233152.05
18	6	20352769.	354564885.	72	60	463533.25	2706029.75
19	7	19195015.	334212116.	73	61	401430.44	2242496.50
20	8	18166135.	315017101.	74	62	343104.54	1841066.06
21	9	17229999.	296850966.	75	63	288932.50	1497961.52
22	10	16368620.	279620967.	76	64	241670.26	1209029.02
23	11	15558815.	263252347.	77	65	200157.35	967358.76
24	12	14783419.	247693532.	78	66	164724.75	767201.41
25	13	14043425.	232910113.	79	67	135153.85	602476.66
26	14	13335063.	218666688.	80	68	109482.25	467322.81
27	15	12657383.	205531625.	81	69	88162.996	357840.564
28	16	12001263.	192874242.	82	70	69822.651	269677.568
29	17	11362559.	180872979.	83	71	54712.166	199854.917
30	18	10743361.	169510420.	84	72	42041.415	145142.751
31	19	10154595.	158767059.	85	73	31688.685	103101.336
32	20	9596623.8	148612464.2	86	74	23166.085	71412.651
33	21	9069552.4	139015840.4	87	75	16345.793	48246.566
34	22	8573108.5	129946288.0	88	76	11142.092	31900.773
35	23	8102606.0	121373179.5	89	77	7497.7477	20758.6812
36	24	7656740.5	113270573.5	90	78	5048.3399	13260.9335
37	25	7232890.8	105613833.0	91	79	3198.7559	8212.5936
38	26	6828893.3	98380942.2	92	80	1936.8096	5013.8377
39	27	6445079.8	91552048.9	93	81	1177.6565	3077.0281
40	28	6076020.5	85106969.1	94	82	726.54758	1899.37162
41	29	5716188.6	79030948.6	95	83	450.23789	1172.82404
42	30	5367348.3	73314760.0	96	84	281.82720	722.58615
43	31	5035346.5	67947411.7	97	85	178.40153	440.75895
44	32	4722384.5	62912065.2	98	86	110.03398	262.35742
45	33	4428242.8	58189680.7	99	87	67.04768	152.32344
46	34	4152708.7	53761437.9	100	88	41.34248	85.27576
47	35	3893886.4	49608729.2	101	89	24.12178	43.93328
48	36	3651600.9	45714842.8	102	90	12.99744	19.81150
49	37	3425693.1	42063241.9	103	91	5.54468	6.81407
50	38	3213597.2	38637548.8	104	92	1.26939	1.26939
51	39	3014492.8	35423951.6	Difference of Age 93 years.			
52	40	2823189.9	32409458.8	93	0	14069.970	41492.0978
53	41	2638574.0	29586268.9	94	1	8479.0608	27422.1278
54	42	2461736.5	26947694.9	95	2	5621.8308	18943.0670
55	43	2293615.0	24485958.4	96	3	3875.2572	13321.2362
56	44	2134289.0	22192343.4	97	4	2805.5144	9445.9790
57	45	1983418.0	20058054.4	98	5	2037.8773	6640.4646
58	46	1839627.6	18074636.4	99	6	1512.1970	4602.5873
59	47	1700481.2	16235008.8	100	7	1175.0530	3090.3903
60	48	1565645.1	14534527.6	101	8	871.04938	1915.33735
61	49	1434737.3	12968882.5	102	9	594.31234	1044.28797
62	50	1311986.0	11534145.2	103	10	341.12993	449.97563
63	51	1198039.7	10222159.2	104	11	108.84570	108.84570
64	52	1092064.7	9024119.5				
65	53	992972.96	7932054.83				

Difference of Age 93 years.

COMMUTATION TABLES FOR JOINT ANNUITIES.

Difference of Age 13 years.

AGES.		D_{xy}	N_{xy}	AGES.		D_{xy}	N_{xy}
(x)	(y)			(x)	(y)		
13	0	38244558.	500775785.	67	54	829311.56	6214893.11
14	1	30952915.	462531227.	68	55	749144.00	5385581.55
15	2	27212236.	431578312.	69	56	674560.56	4636437.55
16	3	24315521.	404366076.	70	57	605044.62	3961876.99
17	4	22342292.	380050555.	71	58	540198.42	3356832.37
18	5	20721656.	357708263.	72	59	477020.62	2816633.95
19	6	19433716.	336986607.	73	60	415339.70	2339613.33
20	7	18327340.	317552891.	74	61	355838.31	1924273.63
21	8	17344105.	299225551.	75	62	300160.91	1568435.32
22	9	16452237.	281881446.	76	63	251281.71	1268274.41
23	10	15628976.	265429209.	77	64	208447.50	1016992.70
24	11	14855027.	249800233.	78	65	171782.75	808545.20
25	12	14113995.	234945206.	79	66	141153.10	636762.45
26	13	13404528.	220831211.	80	67	114567.72	495609.35
27	14	12727702.	207426683.	81	68	92457.669	381041.630
28	15	12076019.	194698981.	82	69	73428.651	288583.961
29	16	11439297.	182622962.	83	70	57691.660	215155.310
30	17	10818161.	171183665.	84	71	44670.229	157463.650
31	18	10225791.	160365504.	85	72	34005.434	112793.421
32	19	9664383.2	150139713.5	86	73	25129.099	78787.987
33	20	9134045.7	140475330.3	87	74	17965.734	53658.888
34	21	8633070.3	131341284.6	88	75	12318.815	35693.154
35	22	8159676.3	122708214.3	89	76	8358.4163	23374.3387
36	23	7711052.8	114548538.0	90	77	5655.9720	15015.9224
37	24	7284563.1	106837485.2	91	78	3589.3532	9359.9504
38	25	6879209.0	99552922.1	92	79	2196.9477	5770.5972
39	26	6492920.0	92673713.1	93	80	1340.8681	3573.6495
40	27	6123588.5	86180793.1	94	81	838.78666	2232.78139
41	28	5766348.2	80057204.6	95	82	523.95261	1393.99473
42	29	5420622.2	74290856.4	96	83	331.90613	870.04212
43	30	5086736.8	68870234.2	97	84	212.07733	538.13599
44	31	4771077.7	63783497.4	98	85	133.41995	326.05866
45	32	4473561.0	59012419.7	99	86	83.13006	192.63871
46	33	4194872.1	54538858.7	100	87	52.74730	109.50864
47	34	3933827.4	50343986.6	101	88	30.91852	56.76134
48	35	3689444.9	46410159.2	102	89	16.56715	25.84282
49	36	3462226.9	42720714.3	103	90	7.49852	9.27566
50	37	3248863.9	39258487.4	104	91	1.77714	1.77714
51	38	3048535.0	36009623.5	Difference of Age 92 years.			
52	39	2857123.8	32961088.5	92	0	20323.291	58297.988
53	40	2673340.6	30103964.7	93	1	11904.602	37974.697
54	41	2496121.0	27430624.1	94	2	7795.605	26070.095
55	42	2327060.6	24934503.1	95	3	5256.8707	18274.4904
56	43	2165871.9	22607442.5	96	4	3728.2169	13017.6197
57	44	2013209.2	20441570.6	97	5	2724.9331	9289.4028
58	45	1867279.3	18428361.4	98	6	2001.5991	6564.4697
59	46	1726055.1	16561082.1	99	7	1493.6230	4562.8706
60	47	1588847.5	14835027.0	100	8	1164.7174	3069.2476
61	48	1455012.9	13246179.5	101	9	865.3188	1904.5302
62	49	1330187.3	11791166.6	102	10	591.29181	1039.21137
63	50	1214334.0	10460979.3	103	11	339.59854	447.91956
64	51	1107899.1	9246645.3	104	12	108.32102	108.32102
65	52	1008300.3	8138746.2				
66	53	915552.75	7130445.86				

Difference of Age 92 years.

COMMUTATION TABLES FOR JOINT ANNUITIES.

Difference of Age 14 years.

AGES.		D _{s,y}	N _{s,y}	AGES.		D _{s,y}	N _{s,y}
(x)	(y)			(x)	(y)		
14	0	36583046.	476704066.	68	54	762019.05	5540470.42
15	1	29597986.	440121020.	69	55	686871.29	4778451.37
16	2	26003634.	410523034.	70	56	616763.12	4091580.08
17	3	23223468.	384519400.	71	57	551727.90	3474816.96
18	4	21334434.	361295932.	72	58	488853.89	2923089.06
19	5	19785945.	339961498.	73	59	427424.79	2434235.17
20	6	18555251.	320175553.	74	60	368167.85	2006810.38
21	7	17498015.	301620302.	75	61	311300.90	1638642.53
22	8	16561192.	284122287.	76	62	261046.94	1327341.63
23	9	15708814.	267561095.	77	63	216737.65	1066294.69
24	10	14922014.	251852281.	78	64	178897.68	849557.04
25	11	14182360.	236930267.	79	65	147201.12	670659.36
26	12	13471887.	222747907.	80	66	119653.19	523458.24
27	13	12794002.	209276020.	81	67	96752.342	403805.046
28	14	12143108.	196482018.	82	68	77005.571	307052.704
29	15	11510552.	184338910.	83	69	60671.155	230047.133
30	16	10891222.	172828358.	84	70	47102.864	169375.978
31	17	10296988.	161937136.	85	71	36131.766	122273.114
32	18	9732142.6	151640147.8	86	72	26966.279	86141.348
33	19	9198538.9	141908005.2	87	73	19488.088	59175.069
34	20	8694459.8	132709466.3	88	74	13539.664	39686.981
35	21	8216746.4	124015006.5	89	75	9241.1534	26147.3170
36	22	7765365.1	115798260.1	90	76	6305.2225	16906.1636
37	23	7336235.4	108032895.0	91	77	4021.3776	10600.9411
38	24	6928354.4	100696659.6	92	78	2465.2152	6579.5635
39	25	6540760.2	93768305.2	93	79	1520.9638	4114.3483
40	26	6169042.4	87227545.0	94	80	955.03427	2593.38454
41	27	5811491.9	81058502.6	95	81	604.89425	1638.35027
42	28	5468188.2	75247010.7	96	82	386.24711	1033.45602
43	29	5137225.5	69778822.5	97	83	249.76214	647.20891
44	30	4819770.9	64641597.0	98	84	158.60484	397.44677
45	31	4519688.5	59821826.1	99	85	100.79804	238.84193
46	32	4237802.0	55302137.6	100	86	65.39952	138.04389
47	33	3973768.4	51064335.6	101	87	39.44777	72.64436
48	34	3727288.9	47090567.2	102	88	21.23525	33.19659
49	35	3498108.3	43363278.3	103	89	9.55797	11.96135
50	36	3283511.8	39865170.0	104	90	2.40337	2.40337
51	37	3081990.2	36581658.2	Difference of Age 91 years.			
52	38	2889388.8	33499668.0	91	0	29590.711	82885.622
53	39	2705473.4	30610279.2	92	1	17195.536	53294.911
54	40	2529010.6	27904805.8	93	2	10945.030	36099.375
55	41	2359564.1	25375795.2	94	3	7289.527	25154.345
56	42	2197454.7	23016231.1	95	4	5057.4074	17864.8177
57	43	2043000.3	20818776.4	96	5	3621.1332	12807.4103
58	44	1895326.0	18775776.1	97	6	2676.4239	9186.2771
59	45	1751999.7	16880450.1	98	7	1977.0138	6509.8532
60	46	1612742.6	15128450.4	99	8	1480.4853	4532.8394
61	47	1476575.8	13515707.8	100	9	1157.0548	3052.3541
62	48	1348985.4	12039132.0	101	10	860.92091	1895.29928
63	49	1231180.5	10690146.6	102	11	588.63741	1034.37837
64	50	1122967.3	9458966.1	103	12	337.96154	445.74096
65	51	1022920.1	8335998.8	104	13	107.77942	107.77942
66	52	929685.01	7313078.67				
67	53	842923.24	6383393.66				

Difference of Age 91 years.

COMMUTATION TABLES FOR JOINT ANNUITIES.

Difference of Age 15 years.

AGES.		$D_{x,y}$	$N_{x,y}$	AGES.		$D_{x,y}$	$N_{x,y}$
(x)	(y)			(x)	(y)		
15	0	34981664.	453637955.	69	54	698676.10	4913586.94
16	1	28283423.	418656291.	70	55	628019.04	4214910.84
17	2	24835766.	390372868.	71	56	562413.76	3586891.80
18	3	22175860.	365537102.	72	57	499287.53	3024478.04
19	4	20371052.	343361242.	73	58	438027.76	2525190.51
20	5	18891558.	322990190.	74	59	378880.39	2087162.75
21	6	17715613.	304098632.	75	60	322087.24	1708282.36
22	7	16708155.	286383019.	76	61	270735.28	1386195.12
23	8	15812846.	269674864.	77	62	225160.44	1115459.84
24	9	14998241.	253862018.	78	63	186012.60	890299.40
25	10	14246314.	238863777.	79	64	153297.92	704286.80
26	11	13537142.	224617463.	80	65	124780.00	550988.88
27	12	12858294.	211080321.	81	66	101047.01	426208.88
28	13	12206364.	198222027.	82	67	80582.493	325161.873
29	14	11574500.	186015663.	83	68	63626.620	244579.380
30	15	10950064.	174441163.	84	69	49535.497	180952.760
31	16	10366529.	163482099.	85	70	38099.416	131417.263
32	17	9799902.1	153115569.7	86	71	28652.459	93317.847
33	18	9263032.2	143315667.6	87	72	20912.856	64665.388
34	19	8755849.3	134052635.4	88	73	14686.969	43752.532
35	20	8275175.4	125296786.1	89	74	10156.993	29065.563
36	21	7819677.4	117021610.7	90	75	6971.1207	18908.5699
37	22	7387907.7	109201933.3	91	76	4482.9927	11937.4492
38	23	6977500.0	101814025.6	92	77	2761.9353	7454.4565
39	24	6587488.0	94836525.6	93	78	1706.6874	4692.5212
40	25	6214496.3	88249037.6	94	79	1083.3075	2985.8338
41	26	5854629.2	82034541.3	95	80	688.72667	1902.52634
42	27	5510997.6	76179912.1	96	81	445.91562	1213.79967
43	28	5182304.7	70668914.5	97	82	290.65418	767.88405
44	29	4867609.8	65486609.8	98	83	186.78793	477.22987
45	30	4565816.1	60619000.0	99	84	119.82508	290.44194
46	31	4281498.6	56053183.9	100	85	79.29915	170.61686
47	32	4014435.6	51771685.3	101	86	48.90990	91.31771
48	33	3765132.9	47757249.7	102	87	27.09325	42.40781
49	34	3533989.6	43992116.8	103	88	12.25111	15.31456
50	35	3317541.1	40458127.2	104	89	3.06345	3.06345
51	36	3114858.5	37140586.1	Difference of Age 90 years.			
52	37	2921097.6	34025727.6	90	0	41618.631	117292.512
53	38	2736025.9	31104630.0	91	1	25036.701	75673.881
54	39	2559408.6	28368604.1	92	2	15809.488	50637.180
55	40	2390654.4	25809195.5	93	3	10234.496	34827.692
56	41	2228147.9	23418541.1	94	4	7012.9379	24593.1960
57	42	2072791.4	21190393.2	95	5	4912.1460	17580.2581
58	43	1923372.7	19117601.8	96	6	3556.6699	12668.1121
59	44	1778314.9	17194229.1	97	7	2643.5499	9111.4422
60	45	1636983.9	15415914.2	98	8	1959.6242	6467.8923
61	46	1498782.3	13778930.3	99	9	1470.7453	4508.2681
62	47	1368977.0	12280148.0	100	10	1151.1742	3037.5228
63	48	1248579.4	10911171.0	101	11	857.05609	1886.34865
64	49	1138546.4	9662591.6	102	12	585.79994	1029.29256
65	50	1036832.6	8524045.2	103	13	336.27173	443.49262
66	51	943165.01	7487212.59	104	14	107.22089	107.22089
67	52	855934.40	6544047.58				
68	53	774526.24	5688113.18				

Difference of Age 90 years.

COMMUTATION TABLES FOR JOINT ANNUITIES.

Difference of Age 16 years.

AGES.		D _{x,y}	N _{x,y}	AGES.		D _{x,y}	N _{x,y}
(x)	(y)			(x)	(y)		
16	0	33427991.	431542180.	70	54	638812.40	4332140.08
17	1	27013166.	398114189.	71	55	572677.81	3693327.68
18	2	23715427.	371101023.	72	56	508957.72	3120649.87
19	3	21174483.	347385596.	73	57	447376.61	2611692.15
20	4	19450217.	326211113.	74	58	388279.13	2164315.54
21	5	18036701.	306760896.	75	59	331458.98	1776036.41
22	6	16915930.	288724195.	76	60	280116.06	1444577.43
23	7	15953168.	271808265.	77	61	233516.91	1164461.37
24	8	15097567.	255855097.	78	62	193241.37	930944.46
25	9	14319089.	240757530.	79	63	159394.72	737703.09
26	10	13598186.	226438441.	80	64	129948.16	578308.37
27	11	12920576.	212840255.	81	65	105376.60	448360.21
28	12	12267702.	199919679.	82	66	84159.413	342983.614
29	13	11634793.	187651977.	83	67	66582.087	258824.201
30	14	11019947.	176017184.	84	68	51948.514	192242.114
31	15	10431102.	164997237.	85	69	40067.066	140293.600
32	16	9866085.7	154566134.9	86	70	30212.803	100226.534
33	17	9327525.5	144700049.2	87	71	22220.519	70013.731
34	18	8817238.7	135372523.7	88	72	15760.728	47793.212
35	19	8333604.4	126555285.0	89	73	11017.662	32032.484
36	20	7875282.9	118221680.6	90	74	7661.990	21014.822
37	21	7439579.9	110346397.7	91	75	4956.4442	13352.8317
38	22	7026645.7	102906817.8	92	76	3078.9785	8396.3875
39	23	6634215.6	95880172.1	93	77	1912.1089	5317.4090
40	24	6258893.1	89245956.5	94	78	1215.5892	3405.3001
41	25	5897766.3	82987063.4	95	79	781.2314	2189.7109
42	26	5551904.4	77089297.1	96	80	507.71516	1408.47946
43	27	5222876.0	71537392.7	97	81	335.55524	900.76430
44	28	4910323.2	66314516.7	98	82	217.36958	565.20906
45	29	4611134.4	61404193.5	99	83	141.11725	347.83948
46	30	4325195.2	56793059.1	100	84	94.26798	206.72223
47	31	4055829.1	52467863.9	101	85	59.30492	112.45425
48	32	3803661.9	484112034.8	102	86	33.59196	53.14932
49	33	3569871.0	44608369.9	103	87	15.63072	19.55736
50	34	3351570.3	41038498.9	104	88	3.92664	3.92664
51	35	3147139.9	37686928.6	Difference of Age 89 years.			
52	36	2952250.0	34539788.7	89	0	55171.065	162234.983
53	37	2766051.6	31587538.7	90	1	35213.524	107063.918
54	38	2588311.6	28821487.1	91	2	23018.614	71850.394
55	39	2419389.3	26233175.5	92	3	14783.162	48831.780
56	40	2257506.6	23813786.2	93	4	9846.165	34048.618
57	41	2101743.4	21556279.6	94	5	6811.5088	24202.4526
58	42	1951419.4	19454536.2	95	6	4824.7001	17390.9438
59	43	1804630.1	17503116.8	96	7	3512.9840	12566.2437
60	44	1661571.6	15698486.7	97	8	2620.2976	9053.2597
61	45	1521310.7	14036915.1	98	9	1946.7320	6432.9621
62	46	1389565.3	12515604.4	99	10	1463.2704	4486.2301
63	47	1267083.0	11126039.1	100	11	1146.0064	3022.9597
64	48	1154636.2	9858956.1	101	12	852.92474	1876.95329
65	49	1051216.7	8704319.9	102	13	582.87093	1024.02855
66	50	955992.76	7653103.16	103	14	334.52911	441.15762
67	51	868345.04	6697110.40	104	15	106.62851	106.62851
68	52	786481.65	5828765.36				
69	53	710143.63	5042283.71				

Difference of Age 89 years.

COMPUTATION TABLE FOR JOINT ANNUITIES

Difference of Age 17 years.

AGE.		D ₁₇	N ₁₇	AGE.		D ₁₇	N ₁₇
x	y			(x)	(y)		
17	1	11026482	47026480	71	54	502520.05	379439.01
18	1	25744605	37946784	72	55	519246.30	321157.96
19	2	22644529	35267360	73	56	456041.40	309632.76
20	3	20217330	3342974	74	57	396566.19	225501.36
21	4	18570090	30911744	75	58	339661.36	1841025.17
22	5	17225225	29134164	76	59	299266.57	1501343.51
23	6	16151555	27413230	77	60	241608.10	121377.24
24	7	15237562	25796754	78	61	204413.21	97149.14
25	8	14413917	24263942	79	62	166592.07	77165.23
26	9	13667451	22822125	80	63	135116.22	65466.26
27	10	12974840	21455467	81	64	109741.11	470350.54
28	11	12327124	20157562	82	65	87765.414	39090.429
29	12	11722250	189244510	83	66	69537.563	27244.014
30	13	11157352	177555251	84	67	54361.530	20335.451
31	14	10629053	166477299	85	68	42013.548	148944.931
32	15	9927541.9	15588845.3	86	69	31773.147	10228.083
33	16	9206514.9	14561303.9	87	70	23430.596	75152.936
34	17	8474628.1	135670745.0	88	71	18746.233	51722.340
35	18	8223023.5	127792156.9	89	72	11223.159	34976.107
36	19	793999.3	119490123.4	90	73	8311.2406	23152.9482
37	20	749242.5	11145225.1	91	74	5447.6499	1441.7076
38	21	705791.2	10307652.6	92	75	3404.1512	9394.0577
39	22	664043.2	95440671.4	93	76	2131.9005	5989.9065
40	23	623229.9	87230013.2	94	77	1361.9009	3458.3060
41	24	583790.4	8316728.3	95	78	876.62691	2496.40512
42	25	5462811.2	7797627.9	96	79	575.90775	1619.77821
43	26	5261844.1	72344916.7	97	80	382.05991	1043.87046
44	27	4947765.1	67122372.6	98	81	250.94943	661.81055
45	28	4651507.1	62173907.5	99	82	164.22152	410.86112
46	29	4364125.2	5752910.4	100	83	111.01881	246.63960
47	30	4077222.5	53153885.2	101	84	70.49956	135.62079
48	31	3842885.1	4956662.7	102	85	40.73140	65.12123
49	32	3606404.8	4521377.6	103	86	19.37998	24.38983
50	33	3385599.6	41007372.8	104	87	5.00985	5.00985
51	34	3179421.3	38221773.2	Difference of Age 88 years.			
52	35	2982946.2	3542351.9	88	0	73545.162	221852.428
53	36	2795560.5	32652595.7	89	1	46680.238	148307.266
54	37	2616716.2	29263955.2	90	2	32375.133	101627.028
55	38	2446711.1	26547239.0	91	3	21524.283	69251.895
56	39	2284641.2	24200627.9	92	4	14222.239	47727.612
57	40	2129436.6	21915886.7	93	5	9563.3596	33505.3730
58	41	1978676.1	19786450.1	94	6	6690.2506	23042.0144
59	42	1830945.3	17807774.0	95	7	4765.4393	17251.7638
60	43	1686150.2	15976828.7	96	8	3482.0843	12486.3245
61	44	1544161.0	14290669.5	97	9	2603.0588	9004.2402
62	45	1410452.1	12746508.5	98	10	1936.8379	6401.1814
63	46	1286139.0	11336056.4	99	11	1456.7015	4464.3435
64	47	1171747.6	10049917.4	100	12	1140.4822	3007.6420
65	48	1066972.4	8878169.8	101	13	848.66012	1867.15985
66	49	969255.33	7812097.40	102	14	579.85041	1018.49973
67	50	880155.18	6842842.07	103	15	332.68089	438.64932
68	51	797885.26	5962686.89	104	16	105.96843	105.96843
69	52	721105.24	5164801.63				
70	53	649297.38	4443696.39				

Difference of Age 88 years.

COMMUTATION TABLES FOR JOINT ANNUITIES.

Difference of Age 18 years.

AGES.		D _{x,y}	N _{x,y}	AGES.		D _{x,y}	N _{x,y}
(x)	(y)			(x)	(y)		
18	0	30486473.	390170493.	72	54	527152.96	3298432.57
19	1	24629819.	359684020.	73	55	464364.15	2771279.61
20	2	21620925.	335054201.	74	56	404246.88	2306915.46
21	3	19302481.	313433276.	75	57	346931.20	1902668.58
22	4	17731827.	294130795.	76	58	295417.48	1555737.38
23	5	16444295.	276398968.	77	59	248638.14	1260319.90
24	6	15420955.	259954673.	78	60	207357.38	1011681.76
25	7	14541825.	244533718.	79	61	171734.64	804324.38
26	8	13758165.	229991893.	80	62	140367.16	632589.74
27	9	13045141.	216233728.	81	63	114105.61	492222.58
28	10	12382712.	203188587.	82	64	91400.495	378116.971
29	11	11749899.	190805875.	83	65	72517.047	286716.476
30	12	11133017.	179055976.	84	66	56774.547	214199.429
31	13	10543692.	167922959.	85	67	43970.629	157424.882
32	14	9982694.9	157379266.8	86	68	33320.909	113454.253
33	15	9449012.8	147396571.9	87	69	24640.672	80133.344
34	16	8938589.9	137947559.1	88	70	17658.193	55492.672
35	17	8450462.3	129008969.2	89	71	12562.451	37834.479
36	18	7986493.8	120558506.9	90	72	8918.8726	25272.0284
37	19	7545385.2	112572013.1	91	73	5909.2650	16353.1558
38	20	7126106.9	105026627.9	92	74	3741.5179	10443.8908
39	21	6727670.8	97900521.0	93	75	2356.7200	6702.3729
40	22	6347686.7	91172850.2	94	76	1518.2339	4345.6529
41	23	5982034.5	84825163.5	95	77	982.14012	2827.41896
42	24	5632766.6	78843129.0	96	78	646.23137	1845.27884
43	25	5300412.2	73210362.4	97	79	433.37541	1199.04747
44	26	4985498.6	67909950.2	98	80	285.72856	765.67206
45	27	4688013.6	62924451.6	99	81	189.59091	479.94350
46	28	4406455.5	58236438.0	100	82	129.19525	290.35259
47	29	4137889.7	53829982.5	101	83	83.02689	161.15734
48	30	3882105.2	49692092.8	102	84	48.42003	78.13045
49	31	3643590.9	45809987.6	103	85	23.49889	29.71042
50	32	3420247.5	42166396.7	104	86	6.21153	6.21153
51	33	3211702.6	38746149.2	Difference of Age 87 years.			
52	34	3013442.3	35534446.6	87	0	97586.822	300668.774
53	35	2824522.7	32521004.3	88	1	62226.562	203081.952
54	36	2644622.6	29696481.6	89	2	42917.571	140855.390
55	37	2473561.8	27051859.0	90	3	30273.392	97937.819
56	38	2310441.3	24578297.2	91	4	20707.580	67664.427
57	39	2155031.7	22267855.9	92	5	13813.741	46956.847
58	40	2004747.7	20112824.2	93	6	9393.112	33143.106
59	41	1856519.2	18108076.5	94	7	6608.0755	23749.9939
60	42	1710746.9	16251557.3	95	8	4723.5231	17141.9184
61	43	1567011.2	14540810.4	96	9	3459.1758	12418.3953
62	44	1431637.2	12973799.2	97	10	2589.8290	8959.2195
63	45	1305471.1	11542162.0	98	11	1928.1431	6369.3905
64	46	1189369.8	10236690.9	99	12	1449.6796	4441.2474
65	47	1081871.3	9047321.1	100	13	1134.7798	2991.5678
66	48	982952.75	7965449.85	101	14	844.26222	1856.78804
67	49	892365.66	6982497.10	102	15	576.64681	1012.52582
68	50	808737.10	6090131.44	103	16	330.62144	435.87901
69	51	731560.92	5281394.34	104	17	105.25757	105.25757
70	52	659319.77	4549833.42				
71	53	592081.08	3890513.65				

Difference of Age 87 years.

COMMUTATION TABLES FOR JOINT ANNUITIES

Difference of Age 19 years.

AGES.		D_{xy}	N_{xy}	AGES.		D_{xy}	N_{xy}
x	y			x	y		
9	0	22109920.	37092429.1	73	54	452344.37	3544561.51
10	1	22516474.	34772445.7	74	55	416244.39	2572536.94
11	2	22942563.	31237799.7	75	56	352650.56	1967912.55
12	3	23431167.	29736543.4	76	57	301722.59	1497351.99
13	4	23990544.	27913425.7	77	58	254806.01	1305532.40
14	5	24704432.	25229363.1	78	59	213320.33	1067733.39
15	6	24722561.	240702230.	79	60	177485.12	837342.56
16	7	24942544.	231740562.	80	61	145575.57	632657.44
17	8	25131523.	217900375.	81	62	115529.35	514000.77
18	9	25483967.	204748752.	82	63	95035.57	395649.239
19	10	2542984.	192322415.	83	64	75529.579	300616.243
20	11	25740022.	180519931.	84	65	59207.141	224264.673
21	12	26260775.	169332049.	85	66	45922.412	165777.492
22	13	26946981.	159736214.	86	67	34268.579	112855.080
23	14	27704773.	148701617.7	87	68	25440.290	84296.410
24	15	28542947.	138290110.4	88	69	18570.153	59145.420
25	16	29072215.	128255441.7	89	70	13246.573	40575.267
26	17	29429902.	121498209.2	90	71	9475.5622	27324.6943
27	18	29692973.	116356270.0	91	72	6341.2993	17552.1321
28	19	29742267.	106657222.2	92	73	4058.5672	11510.8428
29	20	29775711.	98881239.4	93	74	2590.2915	7452.2816
30	21	29792016.	92150900.5	94	75	1775.5755	4892.0001
31	22	29741596.	85712944.3	95	76	1094.8948	3153.4246
32	23	29627220.	79569736.3	96	77	724.01354	1968.54429
33	24	29492707.	7417144.3	97	78	426.29451	1364.53075
34	25	2922220.	68674735.6	98	79	244.19564	878.23624
35	26	27228115.	63656733.4	99	80	215.56635	554.13070
36	27	24497529.	58938621.1	100	81	149.15368	339.26435
37	28	21741907.	5442735.3	101	82	96.52938	189.11067
38	29	20263713.	5017535.6	102	83	57.02226	92.49029
39	30	18877711.	4528792.3	103	84	27.93463	35.46633
40	31	14557142.	42717125.2	104	85	7.53170	7.53170
41	32	12445710.	38294211.0	Difference of Age 86 years.			
42	33	9449395.	30077440.1	86	0	125634.25	40125.749
43	34	2924944.8	22579011.6	87	1	92568.210	275391.499
44	35	2672390.5	9117964.8	88	2	57230.751	193023.289
45	36	2406941.4	2744747.3	89	3	4131.433	135612.508
46	37	2227790.5	2404754.9	90	4	29124.718	95681.075
47	38	2170292.2	2261175.4	91	5	20112.806	66556.357
48	39	212944.2	2042270.2	92	6	13567.829	46443.551
49	40	198691.2	1493526.9	93	7	277.7382	32875.7221
50	41	1734941.9	10522544.5	94	8	6549.2517	23597.9839
51	42	159061.4	1474742.9	95	9	462.4473	17048.0322
52	43	1452922.3	13198041.5	96	10	3441.7949	12355.5849
53	44	132779.4	11745219.2	97	11	2575.2928	8913.9900
54	45	127247.3	10429120.4	98	12	1918.8487	6335.7872
55	46	1074141.8	9212692.5	99	13	1442.4312	4416.9385
56	47	975515.44	8114750.73	100	14	1128.8991	2974.5073
57	48	874376.47	7117290.59	101	15	839.29779	1845.60823
58	49	819956.77	6212254.42	102	16	573.07709	1006.01044
59	50	741510.69	5392297.65	103	17	328.49356	432.93335
60	51	668879.96	4659756.96	104	18	145.5279	104.52979
61	52	601229.31	3981907.36				
62	53	535995.24	339627.05				

Difference of Age 86 years.

COMMUTATION TABLES FOR JOINT ANNUITIES.

Difference of Age 20 years.

AGES.		D _{x,y}	N _{x,y}	AGES.		D _{x,y}	N _{x,y}
(x)	(y)			(x)	(y)		
20	0	27793965.	352348024.	74	54	418698.71	2434680.41
21	1	22452336.	324554059.	75	55	360104.68	2015981.70
22	2	19710758.	302101723.	76	56	307566.36	1655877.02
23	3	17598323.	282390965.	77	57	260244.35	1348310.66
24	4	16164745.	264792642.	78	58	218684.34	1088066.31
25	5	14989504.	248627897.	79	59	182855.20	869381.97
26	6	14052862.	233638393.	80	60	150620.79	686526.77
27	7	13248061.	219585531.	81	61	122939.37	535905.98
28	8	12528391.	206337470.	82	62	98728.82	412966.61
29	9	11863177.	193809079.	83	63	78524.092	314237.788
30	10	11237389.	181945902.	84	64	61659.434	235713.696
31	11	10648003.	170708513.	85	65	47890.061	174054.262
32	12	10085122.	160060510.	86	66	36416.432	126164.201
33	13	9551002.1	149975388.4	87	67	27041.308	89747.769
34	14	9044236.9	140424386.3	88	68	19474.759	62706.461
35	15	8560526.3	131380149.4	89	69	13930.694	43231.702
36	16	8096411.5	122819623.1	90	70	9992.6333	29301.0082
37	17	7651190.2	114723211.6	91	71	6737.8049	19308.3749
38	18	7226738.3	107072021.4	92	72	4355.2813	12570.5700
39	19	6823351.3	99845283.1	93	73	2809.7730	8215.2887
40	20	6437537.4	93021931.8	94	74	1844.9298	5405.5157
41	21	6066302.6	86584394.4	95	75	1210.5112	3560.5859
42	22	5712677.5	80518091.8	96	76	807.12326	2350.07474
43	23	5376145.3	74805414.3	97	77	544.82626	1542.95148
44	24	5058111.2	69429269.0	98	78	363.68179	998.12522
45	25	4757609.5	64371157.8	99	79	244.85995	634.44343
46	26	4473916.9	59613548.3	100	80	169.82492	389.58348
47	27	4206878.7	55139631.4	101	81	111.54656	219.75856
48	28	3955040.9	50932752.7	102	82	66.36015	108.21200
49	29	3717310.9	46977711.8	103	83	32.89844	41.85185
50	30	3490780.8	43260400.9	104	84	8.95341	8.95341
51	31	3278026.2	39769620.1	Difference of Age 85 years.			
52	32	3075190.9	36491593.9	85	0	158681.45	527276.132
53	33	2882467.0	33416403.0	86	1	106468.36	368594.682
54	34	2699438.5	30533936.0	87	2	75912.789	262126.322
55	35	2525850.0	27834497.5	88	3	53496.751	186213.533
56	36	2360706.9	25308647.5	89	4	38608.711	132716.782
57	37	2203285.0	22947940.6	90	5	28288.183	94108.071
58	38	2051755.6	20744655.6	91	6	19754.759	65819.888
59	39	1903590.1	18692900.0	92	7	13401.178	46065.129
60	40	1757498.1	16789309.9	93	8	9196.1324	32663.9513
61	41	1612068.0	15031811.8	94	9	6506.8599	23467.8189
62	42	1474007.5	13419743.8	95	10	4668.5984	16960.9590
63	43	1344687.7	11945736.3	96	11	3426.1450	12292.3606
64	44	1225380.3	10601048.6	97	12	2565.7748	8866.2156
65	45	1114648.1	9375668.3	98	13	1909.2545	6300.4408
66	46	1012521.8	8261020.2	99	14	1434.9563	4391.1863
67	47	918387.98	7248498.43	100	15	1122.6621	2956.2300
68	48	831544.32	6330110.45	101	16	834.40028	1833.56795
69	49	751797.75	5498566.13	102	17	569.23278	999.16767
70	50	677976.86	4746768.38	103	18	326.13288	429.93489
71	51	609937.72	4068791.52	104	19	103.80201	103.80201
72	52	544075.81	3458853.80				
73	53	480097.58	2914777.99				

Difference of Age 85 years.

COMMUTATION TABLES FOR JOINT ANNUITIES.

Difference of Age 21 years.

AGES.		D _{xy}	N _{xy}	AGES.		D _{xy}	N _{xy}
(x)	(y)			(x)	(y)		
21	0	26536268.	334675076.	75	54	366293.56	2068079.22
22	1	21438838.	308138808.	76	55	313179.44	1701785.66
23	2	18820093.	286699970.	77	56	265284.76	1388606.22
24	3	16802280.	267879877.	78	57	223351.73	1123321.46
25	4	15432771.	251077597.	79	58	187391.22	899969.73
26	5	14307565.	235644826.	80	59	155003.39	712578.51
27	6	13412808.	221337261.	81	60	127199.13	557575.12
28	7	12639567.	207924453.	82	61	102392.98	430375.99
29	8	11941741.	195284886.	83	62	81575.671	327983.010
30	9	11294794.	183343145.	84	63	64111.686	246407.339
31	10	10696019.	172048351.	85	64	49873.579	182295.653
32	11	10133972.	161352332.	86	65	37976.776	132422.074
33	12	9598997.1	151218360.5	87	66	28241.626	94445.298
34	13	9091349.7	141619363.4	88	67	20379.364	66203.672
35	14	8608084.8	132528013.7	89	68	14609.298	45824.308
36	15	8146844.4	123919928.9	90	69	10508.704	31215.010
37	16	7702862.6	115773084.5	91	70	7104.7297	20706.3058
38	17	7277054.0	108070221.9	92	71	4627.6133	13601.5761
39	18	6871191.5	100793167.9	93	72	3015.1946	8973.9628
40	19	6482991.3	93921976.4	94	73	2001.2627	5958.7682
41	20	6109439.9	87438985.1	95	74	1330.4783	3957.5055
42	21	5752632.9	81329545.2	96	75	892.3640	2627.0272
43	22	5414011.8	75576912.3	97	76	607.36701	1734.66325
44	23	5093990.4	70162900.5	98	77	407.45553	1127.29624
45	24	4791598.2	65068910.1	99	78	274.75959	719.84071
46	25	4506881.0	60277311.9	100	79	192.63457	445.08112
47	26	4238105.4	55770430.9	101	80	127.00582	252.44655
48	27	3986004.2	51532325.5	102	81	76.61165	125.44073
49	28	3749930.3	47546321.3	103	82	38.28470	48.82908
50	29	3525428.8	43796391.0	104	83	10.54437	10.54437
51	30	3311481.4	40270962.2	Difference of Age 84 years.			
52	31	3106899.6	36959480.8	84	0	196180.19	681341.144
53	32	2911965.9	33852581.2	85	1	134260.37	485160.954
54	33	2726846.5	30940615.3	86	2	97886.463	350900.584
55	34	2551758.6	28213768.8	87	3	70984.654	253014.121
56	35	2385172.5	25662010.2	88	4	51466.904	182029.467
57	36	2226782.2	23276837.7	89	5	37499.773	130562.563
58	37	2074272.0	21050055.5	90	6	27784.598	93062.790
59	38	1925087.0	18975783.5	91	7	19512.115	65278.192
60	39	1778622.7	17050696.5	92	8	13283.303	45766.077
61	40	1633309.1	15272073.8	93	9	9135.6315	32482.7743
62	41	1494595.8	13638764.7	94	10	6473.7895	23347.1428
63	42	1364296.0	12144168.9	95	11	4647.6403	16873.3533
64	43	1243513.3	10779872.9	96	12	3409.6296	12225.7130
65	44	1131390.2	9536359.6	97	13	2552.9460	8816.0834
66	45	1027741.1	8404969.4	98	14	1899.3604	6263.1374
67	46	932199.84	7377228.32	99	15	1427.0284	4363.7770
68	47	843867.57	6445028.48	100	16	1115.7123	2936.7486
69	48	762422.07	5601160.91	101	17	828.80296	1821.03632
70	49	687382.50	4838738.84	102	18	565.29694	992.23336
71	50	618233.32	4151356.34	103	19	323.86220	426.93642
72	51	551964.65	3533123.02	104	20	103.07422	103.07422
73	52	487508.25	2981158.37				
74	53	425570.90	2493650.12				

Difference of Age 84 years.

COMMUTATION TABLES FOR JOINT ANNUITIES.

Difference of Age 22 years.

AGES.		D _{x,y}	N _{x,y}	AGES.		D _{x,y}	N _{x,y}
(x)	(y)			(x)	(y)		
22	0	25338421.	317780650.	76	54	318561.85	1745167.41
23	1	20470087.	292442229.	77	55	270126.21	1426605.56
24	2	17968784.	271972142.	78	56	227677.60	1156479.35
25	3	16041437.	254003358.	79	57	191390.72	928801.75
26	4	14730667.	237961921.	80	58	158848.50	737411.03
27	5	13655910.	223231254.	81	59	130900.23	578562.53
28	6	12796747.	209575344.	82	60	105940.82	447662.30
29	7	12047711.	196778597.	83	61	84603.222	341721.480
30	8	11369593.	184730886.	84	62	66603.175	257118.258
31	9	10750658.	173361293.	85	63	51857.098	190515.083
32	10	10179670.	162610635.	86	64	39549.704	138657.985
33	11	9645492.2	152430964.6	87	65	29451.703	99108.281
34	12	9137034.9	142785472.4	88	66	21283.970	69656.578
35	13	8652925.6	133648437.5	89	67	15287.902	48372.608
36	14	8192104.6	124995511.9	90	68	11020.613	33084.706
37	15	7750844.0	116803407.3	91	69	7471.6545	22064.0926
38	16	7326199.5	109052563.3	92	70	4879.6221	14592.4381
39	17	6919031.8	101726363.8	93	71	3203.7322	9712.8160
40	18	6528445.2	94807332.0	94	72	2147.5745	6509.0838
41	19	6152577.2	88278886.8	95	73	1443.2184	4361.5093
42	20	5793539.7	82126309.6	96	74	980.80127	2918.29088
43	21	5451878.3	76332769.9	97	75	671.51138	1937.48961
44	22	5129869.6	70880891.6	98	76	454.22746	1265.97823
45	23	4825586.9	65751022.0	99	77	307.83040	811.75077
46	24	4539078.5	60925435.1	100	78	216.15701	503.92037
47	25	4269332.0	56386356.6	101	79	144.06432	287.76336
48	26	4015591.3	52117024.6	102	80	87.22927	143.69904
49	27	3779287.8	48101433.3	103	81	44.19903	56.46977
50	28	3556364.4	44322145.5	104	82	12.27074	12.27074
51	29	3344349.7	40765781.1	Difference of Age 83 years.			
52	30	3138608.4	37421431.4	83	0	240281.80	868646.952
53	31	2941991.6	34282823.0	84	1	165988.06	628365.152
54	32	2754752.9	31340831.4	85	2	123438.30	462377.092
55	33	2577667.1	28586078.5	86	3	91531.834	338938.792
56	34	2409638.1	26008411.4	87	4	68291.258	247406.958
57	35	2249859.9	23598773.3	88	5	49988.647	179115.700
58	36	2096393.3	21348913.4	89	6	36832.203	129127.053
59	37	1946213.3	19252520.1	90	7	27443.325	92294.850
60	38	1798708.4	17306306.8	91	8	19340.489	64851.525
61	39	1652941.0	15507598.4	92	9	13195.913	45511.036
62	40	1514289.1	13854657.4	93	10	9089.2006	32315.1230
63	41	1383352.0	12340368.3	94	11	6444.7275	23225.9224
64	42	1261646.3	10957016.3	95	12	4625.2368	16781.1949
65	43	1148132.3	9695370.0	96	13	3392.5815	12155.9581
66	44	1043177.9	8547237.7	97	14	2539.7162	8763.3766
67	45	946211.85	7504059.78	98	15	1888.8667	6223.6604
68	46	856558.70	6557847.93	99	16	1418.1944	4334.7937
69	47	773720.96	5701289.23	100	17	1108.2279	2916.5993
70	48	697096.52	4927568.27	101	18	823.07237	1808.37143
71	49	626810.14	4230471.75	102	19	561.36109	985.29906
72	50	559471.78	3603661.61	103	20	321.59152	423.93797
73	51	494576.89	3044189.83	104	21	102.34645	102.34645
74	52	432139.91	2549612.94				
75	53	372305.62	2117473.03				

Difference of Age 83 years.

COMMUTATION TABLES FOR JOINT ANNUITIES.

Difference of Age 23 years.

AGES.		D_{xy}	N_{xy}	AGES.		D_{xy}	N_{xy}
(x)	(y)			(x)	(y)		
23	0	24193461.	301626419.	77	54	274768.69	1462470.42
24	1	19544143.	277432958.	78	55	231832.72	1187701.73
25	2	17155120.	257888815.	79	56	195097.58	955869.01
26	3	15311642.	240733695.	80	57	162238.81	760771.43
27	4	14059741.	225422053.	81	58	134147.42	598532.62
28	5	13028683.	211362312.	82	59	109023.37	464385.20
29	6	12197531.	198333629.	83	60	87534.66	355361.83
30	7	11470486.	186136098.	84	61	69075.044	267827.172
31	8	10821854.	174665612.	85	62	53872.352	198752.128
32	9	10231671.	163843758.	86	63	41122.632	144879.776
33	10	9688987.7	153612087.1	87	64	30671.538	103757.144
34	11	9181292.5	143923099.4	88	65	22195.930	73085.606
35	12	8696407.7	134741806.9	89	66	15966.506	50889.676
36	13	8234778.6	126045399.2	90	67	11532.523	34923.170
37	14	7793904.3	117810620.6	91	68	7835.6203	23390.6466
38	15	7371834.7	110016716.3	92	69	5131.6309	15555.0263
39	16	6965759.5	102644881.6	93	70	3378.1998	10423.3954
40	17	6573899.1	95679122.1	94	71	2281.8604	7045.1956
41	18	6195714.4	89105223.0	95	72	1548.7316	4763.3352
42	19	5834446.5	82909508.6	96	73	1063.9110	3214.6036
43	20	5490646.4	77075062.1	97	74	738.06117	2150.69256
44	21	5165748.8	71584415.7	98	75	502.19869	1412.63139
45	22	4859575.6	66418666.9	99	76	343.16634	910.43270
46	23	4571276.0	61559091.3	100	77	242.17426	567.26636
47	24	4299832.4	56987815.3	101	78	161.65589	325.09210
48	25	4045178.4	52687982.9	102	79	98.94527	163.43621
49	26	3807340.5	48642804.5	103	80	50.32458	64.49094
50	27	3584206.5	44835464.0	104	81	14.16636	14.16636
51	28	3373696.4	41251257.5	Difference of Age 82 years.			
52	29	3169760.8	37877561.1	82	0	290806.54	1093700.58
53	30	2972017.3	34707800.3	83	1	203302.43	802894.04
54	31	2783157.5	31735783.0	84	2	152608.57	599591.61
55	32	2604046.8	28952625.5	85	3	115424.89	446983.04
56	33	2434103.7	26348578.7	86	4	88058.807	331558.150
57	34	2272937.5	23914475.0	87	5	66329.763	243499.343
58	35	2118119.6	21641537.5	88	6	49098.750	177169.580
59	36	1966969.0	19523417.9	89	7	36379.800	128070.830
60	37	1818447.8	17556448.9	90	8	27201.937	91691.030
61	38	1671607.4	15738001.1	91	9	19213.249	64489.093
62	39	1532490.4	14066393.7	92	10	13128.846	45275.844
63	40	1401579.4	12533903.3	93	11	9048.3977	32146.9983
64	41	1279268.4	11132323.9	94	12	6413.6614	23098.6006
65	42	1164874.5	9853055.5	95	13	4602.1106	16684.9392
66	43	1058614.7	8688181.0	96	14	3375.0006	12082.8286
67	44	960424.05	7629566.35	97	15	2525.6846	8707.8280
68	45	869433.76	6669142.30	98	16	1877.1737	6182.1434
69	46	785357.13	5799708.54	99	17	1408.6809	4304.9697
70	47	707427.30	5014351.41	100	18	1100.5653	2896.2888
71	48	635668.15	4306924.11	101	19	817.34178	1795.72347
72	49	567233.38	3671255.96	102	20	557.42525	978.38169
73	50	501303.50	3104022.58	103	21	319.32085	420.95644
74	51	438405.74	2602719.08	104	22	101.63559	101.63559
75	52	378052.44	2164313.34				
76	53	323790.48	1786260.90				

Difference of Age 83 years.

COMMUTATION TABLES FOR JOINT ANNUITIES.

Difference of Age 24 years.

AGES.		D _{x,y}	N _{x,y}	AGES.		D _{x,y}	N _{x,y}
(x)	(y)			(x)	(y)		
24	0	23099093.	286179807.	78	54	235817.08	1217133.43
25	1	18659142.	263080714.	79	55	198658.11	981316.35
26	2	16374658.	244421572.	80	56	165381.05	782658.24
27	3	14614254.	228046914.	81	57	137010.53	617277.19
28	4	13413966.	213432660.	82	58	111727.87	480266.66
29	5	12418607.	200018694.	83	59	90081.647	368538.789
30	6	11613128.	187600087.	84	60	71468.443	278457.142
31	7	10917887.	175986959.	85	61	55871.738	206988.699
32	8	10299431.	165069072.	86	62	42720.727	151116.961
33	9	9738482.5	154769641.4	87	63	31891.373	108396.234
34	10	9222694.6	145031158.9	88	64	23115.244	76504.861
35	11	8738530.9	135808464.3	89	65	16650.627	53389.617
36	12	8276159.4	127069933.4	90	66	12044.432	36738.990
37	13	7834503.9	118793774.0	91	67	8199.5861	24694.5585
38	14	7412789.4	110959270.1	92	68	5381.6075	16494.9724
39	15	7009149.4	103546480.7	93	69	3552.6674	11113.3649
40	16	6618295.9	96537331.3	94	70	2406.1251	7560.6975
41	17	6238851.6	89919035.4	95	71	1645.5725	5154.5724
42	18	5875353.2	83680183.8	96	72	1141.6932	3508.9999
43	19	5529414.5	77804830.6	97	73	800.60194	2367.30673
44	20	5202482.2	72275416.1	98	74	551.96882	1566.70479
45	21	4893564.3	67072933.9	99	75	379.40833	1014.73597
46	22	4603473.5	62179369.6	100	76	269.97351	635.32764
47	23	4330332.8	57575896.1	101	77	181.11324	365.35413
48	24	4074077.4	53245563.3	102	78	111.02739	184.24089
49	25	3835393.2	49171485.9	103	79	57.08382	73.21350
50	26	3610811.2	45386092.7	104	80	16.12968	16.12968
51	27	3400108.4	41725281.5	Difference of Age 81 years.			
52	28	3197575.5	38325173.1	81	0	349160.38	1362286.81
53	29	3001516.3	35127597.6	82	1	246051.41	1013126.43
54	30	2811562.2	32126081.3	83	2	186915.21	767075.02
55	31	2630897.5	29314519.1	84	3	142701.47	580159.81
56	32	2459014.1	26683621.6	85	4	111045.28	437458.34
57	33	2296015.1	24224607.5	86	5	85529.539	326413.065
58	34	2139846.0	21928592.4	87	6	65148.962	240883.526
59	35	1987354.0	19788746.4	88	7	48495.680	175734.564
60	36	1837840.8	17801392.4	89	8	36059.808	127238.884
61	37	1689951.9	15963551.6	90	9	27022.977	91179.076
62	38	1549796.5	14273599.7	91	10	19115.599	64156.099
63	39	1418426.0	12723803.2	92	11	13069.908	45040.500
64	40	1296124.4	11305377.2	93	12	9004.7808	31970.5924
65	41	1181145.0	10009252.8	94	13	6381.5932	22965.8116
66	42	1074051.4	8828107.8	95	14	4578.2617	16584.2184
67	43	974636.25	7754056.38	96	15	3356.3542	12005.9567
68	44	882492.73	6779420.13	97	16	2510.0494	8649.6025
69	45	797161.94	5896927.40	98	17	1864.5813	6139.5531
70	46	718066.47	5099765.46	99	18	1398.9408	4274.9718
71	47	645088.59	4381698.99	100	19	1092.9027	2876.0310
72	48	575249.46	3736610.40	101	20	811.61119	1783.12830
73	49	508258.14	3161360.94	102	21	553.48941	971.51711
74	50	444368.38	2653102.80	103	22	317.10297	418.02770
75	51	383534.03	2208734.42	104	23	100.92473	100.92473
76	52	328788.43	1825200.39				
77	53	279278.53	1496411.96				

Difference of Age 81 years.

COMMUTATION TABLES FOR JOINT ANNUITIES.

Difference of Age 25 years.

AGES.		D_{xy}	N_{xy}	AGES.		D_{xy}	N_{xy}
(x)	(y)			(x)	(y)		
25	0	22053117.	271409318.	79	54	202072.31	1005273.90
26	1	17810256.	249356201.	80	55	168399.25	803201.59
27	2	15628854.	231545945.	81	56	139664.15	634802.34
28	3	13943010.	215917091.	82	57	114112.49	495138.19
29	4	12785848.	201974081.	83	58	92316.267	381025.700
30	5	11823612.	189188233.	84	59	73547.953	288709.433
31	6	11053657.	177364621.	85	60	57807.652	215161.480
32	7	10390827.	166310964.	86	61	44306.238	157353.828
33	8	9802975.8	155920137.1	87	62	33130.726	113047.590
34	9	9269807.5	146117161.3	88	63	24034.559	79916.864
35	10	8777936.5	136847353.8	89	64	17340.266	55882.305
36	11	8316247.0	128069417.3	90	65	12560.503	38542.039
37	12	7873873.3	119753170.3	91	66	8563.5518	25981.5365
38	13	7451403.7	111879297.0	92	67	5631.5839	17417.9847
39	14	7048089.1	104427893.3	93	68	3725.7281	11786.4008
40	15	6659521.5	97379804.2	94	69	2530.3899	8060.6727
41	16	6280985.7	90720282.7	95	70	1735.1865	5530.2828
42	17	5916260.0	84439297.0	96	71	1213.0823	3795.0963
43	18	5568182.7	78523037.0	97	72	859.13367	2582.01398
44	19	5239215.7	72954854.3	98	73	598.74076	1722.88031
45	20	4928362.3	67715638.6	99	74	417.00940	1124.13955
46	21	4635671.0	62787276.3	100	75	298.48556	707.13015
47	22	4360833.2	58151605.3	101	76	201.90327	408.64459
48	23	4102976.5	53790772.1	102	77	124.39095	206.74132
49	24	3862793.5	49687795.6	103	78	64.05427	82.35037
50	25	3637415.9	45825002.1	104	79	18.29610	18.29610
51	26	3425346.6	42187586.2	Difference of Age 80 years.			
52	27	3222608.7	38762239.6	80	0	413452.62	1677975.79
53	28	3027854.6	35539630.9	81	1	295424.60	1264523.17
54	29	2839468.5	32511776.3	82	2	226218.41	969098.57
55	30	2657748.2	29672307.8	83	3	174780.98	742880.16
56	31	2484369.3	27014559.6	84	4	137286.90	568099.18
57	32	2319512.4	24530190.3	85	5	107855.78	430812.28
58	33	2161572.3	22210677.9	86	6	84006.946	322956.504
59	34	2007739.0	20049105.6	87	7	64348.750	238949.558
60	35	1856887.6	18041366.6	88	8	48069.118	174600.808
61	36	1707974.6	16184479.0	89	9	35822.572	126531.690
62	37	1566804.3	14476504.4	90	10	26885.636	90709.118
63	38	1434444.1	12909700.1	91	11	19029.786	63823.482
64	39	1311703.5	11475256.0	92	12	13006.906	44793.696
65	40	1196708.1	10163552.5	93	13	8959.7569	31786.7899
66	41	1089053.4	8966844.4	94	14	6348.5227	22827.0330
67	42	988848.44	7877791.01	95	15	4552.9675	16478.5103
68	43	895551.71	6888942.57	96	16	3335.5767	11925.5428
69	44	809135.39	5993390.86	97	17	2493.2115	8589.9661
70	45	728859.83	5184255.47	98	18	1851.6890	6096.7546
71	46	654790.21	4455395.64	99	19	1389.2008	4245.0656
72	47	583774.50	3800605.43	100	20	1085.2401	2855.8648
73	48	515440.79	3216830.93	101	21	805.88061	1770.62468
74	49	450533.15	2701390.14	102	22	549.64510	964.74407
75	50	388750.37	2250856.99	103	23	314.88510	415.09897
76	51	333555.71	1862106.62	104	24	100.21387	100.21387
77	52	283589.41	1528550.91				
78	53	239687.60	1244961.50				

Difference of Age 80 years.

COMMUTATION TABLES FOR JOINT ANNUITIES.

Difference of Age 26 years.

AGES.		D _{x,y}	N _{x,y}	AGES.		D _{x,y}	N _{x,y}
(x)	(y)			(x)	(y)		
26	0	21049824.	257284080.	80	54	171293.42	822517.10
27	1	16999066.	236234256.	81	55	142213.02	651223.68
28	2	14911009.	219235190.	82	56	116322.62	509010.66
29	3	13290120.	204324181.	83	57	94286.579	392688.037
30	4	12173258.	191034061.	84	58	75372.429	298401.458
31	5	11254000.	178860803.	85	59	59489.675	223029.029
32	6	10520043.	167606803.	86	60	45841.417	163539.354
33	7	9889966.7	157086760.2	87	61	34360.320	117697.937
34	8	9331196.9	147196793.5	88	62	24968.583	83337.617
35	9	8822777.3	137865596.6	89	63	18029.904	58369.034
36	10	8353748.4	129042819.3	90	64	13080.736	40339.130
37	11	7912012.4	120689070.9	91	65	8930.4766	27258.3942
38	12	7488848.0	112777058.5	92	66	5881.5604	18327.9176
39	13	7084803.7	105288210.5	93	67	3898.7887	12446.3572
40	14	6696518.8	98203406.8	94	68	2653.6525	8547.5685
41	15	6320110.2	91506888.0	95	69	1824.8004	5893.9160
42	16	5956215.5	85186777.8	96	70	1279.1439	4069.1156
43	17	5606950.8	79230562.3	97	71	912.85458	2789.97170
44	18	5275949.2	73623611.5	98	72	642.51449	1877.11712
45	19	4963160.2	68347662.3	99	73	452.34535	1234.60263
46	20	4668635.0	63384502.1	100	74	328.06682	782.25728
47	21	4391333.6	58715867.1	101	75	223.22639	454.19046
48	22	4131875.5	54324533.5	102	76	138.66983	230.96407
49	23	3890193.9	50192658.0	103	77	71.76402	92.29424
50	24	3663401.9	46302464.1	104	78	20.53022	20.53022
51	25	3450584.8	42639062.2	Difference of Age 79 years.			
52	26	3246529.3	39188477.4	79	0	487743.94	2048530.27
53	27	3051559.1	35941948.1	80	1	349822.26	1560786.33
54	28	2864384.9	32890389.0	81	2	271611.86	1210964.07
55	29	2684127.8	30026004.1	82	3	211532.68	939352.21
56	30	2509724.6	27341876.3	83	4	168149.20	727819.53
57	31	2343429.2	24832151.7	84	5	133343.67	559670.33
58	32	2183693.7	22488722.5	85	6	105935.74	426326.66
59	33	2028124.0	20305028.8	86	7	82975.104	320390.921
60	34	1875934.4	18276904.8	87	8	63782.747	237415.817
61	35	1725675.5	16400970.4	88	9	47752.874	173633.070
62	36	1583513.7	14675294.9	89	10	35640.508	125880.196
63	37	1450185.9	13091781.2	90	11	26764.942	90239.688
64	38	1326516.3	11641595.3	91	12	18938.055	63474.746
65	39	1211092.2	10315079.0	92	13	12941.872	44536.691
66	40	1103403.0	9103986.8	93	14	8913.326	31594.819
67	41	1002660.3	8000583.8	94	15	6313.448	22681.493
68	42	908610.69	6997923.51	95	16	4524.7824	16368.0453
69	43	821108.84	6089312.82	96	17	3313.2010	11843.2629
70	44	739807.37	5268203.98	97	18	2475.9727	8530.0619
71	45	664632.46	4528396.61	98	19	1838.7967	6054.0892
72	46	592554.03	3863764.15	99	20	1379.4608	4215.2925
73	47	523079.48	3271210.12	100	21	1077.5774	2835.8317
74	48	456900.03	2748130.64	101	22	800.28329	1758.25432
75	49	394143.54	2291230.61	102	23	545.80078	957.97103
76	50	338092.32	1897087.07	103	24	312.66723	412.17025
77	51	287701.32	1558994.75	104	25	99.50302	99.50302
78	52	243387.36	1271293.43				
79	53	205388.97	1027906.07				

Difference of Age 79 years.

COMMUTATION TABLES FOR JOINT ANNUITIES.

Difference of Age 27 years.

AGES.		D_{xy}	N_{xy}	AGES.		D_{xy}	N_{xy}
(x)	(y)			(x)	(y)		
27	0	20091084.	243778105.	81	54	144657.15	666644.62
28	1	16218286.	223687021.	82	55	118445.50	521987.47
29	2	14212791.	207468735.	83	56	96112.72	403541.97
30	3	12653370.	193255944.	84	57	76981.106	307429.251
31	4	11586892.	180602574.	85	58	60965.413	230448.145
32	5	10710715.	169015772.	86	59	47175.260	169482.732
33	6	10012954.	158305057.	87	60	35550.879	122307.472
34	7	9414001.2	148292102.6	88	61	25895.251	86756.593
35	8	8881206.3	138878101.4	89	62	18730.576	60861.342
36	9	8396422.3	129996895.1	90	63	13600.969	42130.766
37	10	7947690.9	121600472.8	91	64	9300.3604	28529.7971
38	11	7525122.1	113652781.9	92	65	6133.5692	19229.4367
39	12	7120405.8	106127659.8	93	66	4071.8493	13095.8675
40	13	6731402.0	99007254.0	94	67	2776.9149	9024.0182
41	14	6355222.0	92275852.0	95	68	1913.6917	6247.1033
42	15	5993316.9	85920630.0	96	69	1345.2054	4333.4116
43	16	5644817.3	79927313.1	97	70	962.56647	2988.20618
44	17	5312682.6	74282495.8	98	71	682.69039	2025.63971
45	18	4997958.2	68969813.2	99	72	485.41616	1342.94932
46	19	4701599.1	63971855.0	100	73	355.86608	857.53316
47	20	4422560.2	59270255.9	101	74	245.34913	501.66708
48	21	4160774.6	54847695.7	102	75	153.31483	256.31795
49	22	3917594.2	50686921.1	103	76	80.00182	103.00312
50	23	3689387.8	46769326.9	104	77	23.00130	23.00130
51	24	3475236.0	43079939.1	Difference of Age 78 years.			
52	25	3270449.9	39604703.1	78	0	569194.01	2478255.27
53	26	3074210.0	36334253.2	79	1	412680.15	1909061.26
54	27	2886809.6	33260043.2	80	2	321624.79	1496381.11
55	28	2707681.0	30373233.6	81	3	253979.26	1174756.32
56	29	2534635.0	27665552.6	82	4	203506.42	920777.06
57	30	2367346.0	25130917.6	83	5	163319.54	717270.64
58	31	2206210.0	22763571.6	84	6	130969.89	553951.10
59	32	2048879.7	20557361.6	85	7	104634.55	422981.21
60	33	1894981.2	18508481.9	86	8	82245.266	318346.657
61	34	1743376.4	16613500.7	87	9	63363.123	236101.391
62	35	1599924.7	14870124.3	88	10	47510.175	172738.268
63	36	1465651.6	13270199.6	89	11	35480.512	125228.093
64	37	1341073.8	11804548.0	90	12	26635.924	89747.581
65	38	1224768.8	10463474.2	91	13	18843.365	63111.657
66	39	1116665.6	9238705.4	92	14	12874.805	44268.292
67	40	1015871.6	8122039.8	93	15	8864.0811	31393.4868
68	41	921301.81	7106168.19	94	16	6274.3647	22529.4057
69	42	833082.30	6184866.38	95	17	4494.4293	16255.0410
70	43	750754.91	5351784.08	96	18	3290.2926	11760.6117
71	44	674615.31	4601029.17	97	19	2458.7339	8470.3191
72	45	601460.79	3926413.86	98	20	1825.9045	6011.5852
73	46	530946.20	3324953.07	99	21	1369.7207	4185.6807
74	47	463671.17	2794006.87	100	22	1070.0930	2815.9600
75	48	399713.54	2330335.70	101	23	794.68597	1745.86702
76	49	342782.70	1930622.16	102	24	541.95647	951.18105
77	50	291614.27	1587839.46	103	25	310.44935	409.22458
78	51	246916.36	1296225.19	104	26	98.77523	98.77523
79	52	208559.31	1049308.83				
80	53	174104.90	840749.52				

Difference of Age 78 years.

COMMUTATION TABLES FOR JOINT ANNUITIES.

Difference of Age 28 years.

GES. (y)	D _{xy}	N _{xy}	AGES.		D _{xy}	N _{xy}
			(x)	(y)		
0	19168285.	230861541.	82	54	120481.15	534161.39
1	15458854.	211693256.	83	55	97866.778	413680.238
2	13531834.	196234402.	84	56	78472.076	315813.460
3	12043784.	182702568.	85	57	62266.601	237341.384
4	11027450.	170658784.	86	58	48345.519	175074.783
5	10194435.	159631334.	87	59	36585.299	126729.264
6	9531069.5	149436898.9	88	60	26792.502	90143.965
7	8960017.5	139905829.4	89	61	19425.732	63351.463
8	8452027.7	130945811.9	90	62	14129.525	43925.731
9	7988290.5	122493784.2	91	63	9670.2444	29796.2059
10	7559055.9	114505493.7	92	64	6387.6104	20125.9615
11	7154895.3	106946437.8	93	65	4246.3170	13738.3511
12	6765228.2	99791542.5	94	66	2900.1775	9492.0341
13	6388327.2	93026314.3	95	67	2002.5830	6591.8566
14	6026613.1	86637987.1	96	68	1410.7343	4589.2736
15	5679979.1	80611374.0	97	69	1012.2784	3178.5393
16	5348561.8	74931394.9	98	70	719.86808	2166.26089
17	5032756.2	69582833.1	99	71	515.76883	1446.39281
18	4734563.2	64550076.9	100	72	381.88332	930.62398
19	4453786.9	59815513.7	101	73	266.13917	548.74066
20	4190361.7	55361726.8	102	74	168.50901	282.60149
21	3944994.5	51171365.1	103	75	88.45086	114.09248
22	3715373.8	47226370.6	104	76	25.64162	25.64162
23	3499887.2	43510996.8	Difference of Age 77 years.			
24	3293814.3	40011109.6				
25	3096861.0	36717295.3	77	0	663211.90	2977046.31
26	2908237.7	33620434.3	78	1	481595.05	2313834.41
27	2728879.0	30712196.6	79	2	379416.01	1832239.36
28	2556876.5	27983317.6	80	3	300745.43	1452823.35
29	2390843.3	25426441.1	81	4	244342.43	1152077.92
30	2228726.4	23035597.8	82	5	197661.21	907735.49
31	2070006.0	20806871.4	83	6	160412.13	710074.28
32	1914374.3	18736865.4	84	7	129361.22	549662.15
33	1761077.3	16822491.1	85	8	103714.19	420300.93
34	1616335.7	15061413.8	86	9	81704.178	316586.744
35	1480841.2	13445078.1	87	10	63041.087	234882.566
36	1355375.8	11964236.9	88	11	47296.894	171841.479
37	1238209.7	10608861.1	89	12	35309.482	124544.585
38	1129275.9	9370651.4	90	13	26502.744	89235.103
39	1028082.1	8241375.5	91	14	18745.715	62732.359
40	933441.15	7213293.37	92	15	12803.673	43986.644
41	844718.46	6279852.22	93	16	8809.2082	31182.9708
42	761702.45	5435133.76	94	17	6232.2750	22373.7626
43	684598.15	4673431.31	95	18	4463.3535	16141.4876
44	610494.79	3988833.16	96	19	3267.3841	11678.1341
45	538926.92	3378338.37	97	20	2441.4951	8410.7500
46	470644.43	2839411.45	98	21	1813.0122	5969.2549
47	405637.19	2368767.02	99	22	1360.2072	4156.2427
48	347626.87	1963129.83	100	23	1062.6086	2796.0355
49	295659.86	1615502.96	101	24	789.08865	1733.42693
50	250274.61	1319843.10	102	25	538.11216	944.33828
51	211583.32	1069568.49	103	26	308.17867	406.22612
52	176792.34	857985.17	104	27	98.04745	98.04745
53	147031.44	681192.83				

Difference of Age 77 years.

CARLISLE

TABLE FOR LIFE ANNUITIES

Interest at 4 per cent.

				D.		N.
60	60	1000000	1000000	1000000	1000000	1000000
61	61	990000	990000	990000	990000	990000
62	62	980000	980000	980000	980000	980000
63	63	970000	970000	970000	970000	970000
64	64	960000	960000	960000	960000	960000
65	65	950000	950000	950000	950000	950000
66	66	940000	940000	940000	940000	940000
67	67	930000	930000	930000	930000	930000
68	68	920000	920000	920000	920000	920000
69	69	910000	910000	910000	910000	910000
70	70	900000	900000	900000	900000	900000
71	71	890000	890000	890000	890000	890000
72	72	880000	880000	880000	880000	880000
73	73	870000	870000	870000	870000	870000
74	74	860000	860000	860000	860000	860000
75	75	850000	850000	850000	850000	850000
76	76	840000	840000	840000	840000	840000
77	77	830000	830000	830000	830000	830000
78	78	820000	820000	820000	820000	820000
79	79	810000	810000	810000	810000	810000
80	80	800000	800000	800000	800000	800000
81	81	790000	790000	790000	790000	790000
82	82	780000	780000	780000	780000	780000
83	83	770000	770000	770000	770000	770000
84	84	760000	760000	760000	760000	760000
85	85	750000	750000	750000	750000	750000
86	86	740000	740000	740000	740000	740000
87	87	730000	730000	730000	730000	730000
88	88	720000	720000	720000	720000	720000
89	89	710000	710000	710000	710000	710000
90	90	700000	700000	700000	700000	700000
91	91	690000	690000	690000	690000	690000
92	92	680000	680000	680000	680000	680000
93	93	670000	670000	670000	670000	670000
94	94	660000	660000	660000	660000	660000
95	95	650000	650000	650000	650000	650000
96	96	640000	640000	640000	640000	640000
97	97	630000	630000	630000	630000	630000
98	98	620000	620000	620000	620000	620000
99	99	610000	610000	610000	610000	610000
100	100	600000	600000	600000	600000	600000

Difference of Age 76 years.

Difference of Age 76 years.

COMMUTATION TABLES FOR JOINT ANNUITIES.

Difference of Age 30 years.

AGES.		D _{x,y}	N _{x,y}	AGES.		D _{x,y}	N _{x,y}
(x)	(y)			(x)	(y)		
30	0	17395339.	206717635.	84	54	81277.453	330966.674
31	1	14009136.	189322296.	85	55	64630.954	249689.221
32	2	12258150.	175313160.	86	56	50333.700	185058.267
33	3	10909860.	163055010.	87	57	38293.069	134724.567
34	4	9990776.6	152145150.2	88	58	28256.051	96431.498
35	5	9235856.7	142154373.6	89	59	20683.632	68175.447
36	6	8633068.7	132918516.9	90	60	15161.667	47491.815
37	7	8112550.0	124285448.2	91	61	10418.889	32330.148
38	8	7647986.0	116172898.2	92	62	6899.7572	21911.2593
39	9	7223874.2	108524912.2	93	63	4598.0662	15011.5021
40	10	6828652.2	101301038.0	94	64	3149.7091	10413.4359
41	11	6451528.4	94472385.8	95	65	2181.0882	7263.7268
42	12	6088449.0	88020857.4	96	66	1541.7919	5082.6386
43	13	5741286.8	81932408.4	97	67	1110.9003	3540.8467
44	14	5411777.5	76191121.6	98	68	793.92365	2429.94644
45	15	5098305.8	70779344.1	99	69	571.94391	1636.02279
46	16	4799724.8	65681038.3	100	70	427.85902	1064.07888
47	17	4516240.1	60881313.5	101	71	303.45463	636.21986
48	18	4249535.9	56365073.4	102	72	196.15144	332.76523
49	19	4001100.0	52115537.5	103	73	105.45456	136.61379
50	20	3767964.4	48114437.5	104	74	31.15923	31.15923
51	21	3549189.7	44346473.1	Difference of Age 75 years.			
52	22	3340542.9	40797283.4	75	0	884126.39	4212090.89
53	23	3141109.4	37456740.5	76	1	650579.73	3327964.50
54	24	2950595.5	34315631.1	77	2	515912.54	2677384.77
55	25	2769390.5	31365035.6	78	3	414031.72	2161472.23
56	26	2596021.4	28595645.1	79	4	341323.21	1747440.51
57	27	2430704.6	25999623.7	80	5	281023.75	1406117.30
58	28	2270599.0	23568919.1	81	6	233099.47	1125093.55
59	29	2111887.9	21298320.1	82	7	191757.83	891994.08
60	30	1953853.0	19186432.2	83	8	157048.18	700236.25
61	31	1797444.6	17232579.2	84	9	127379.80	543188.07
62	32	1649456.1	15435134.6	85	10	102508.22	415808.27
63	33	1511220.2	13785678.5	86	11	80924.006	313300.049
64	34	1383469.2	12274458.3	87	12	62455.566	232376.043
65	35	1264384.0	10890989.1	88	13	46833.559	169920.477
66	36	1153844.3	9626605.1	89	14	34950.870	123086.918
67	37	1051101.9	8472760.8	90	15	26219.737	88136.048
68	38	955328.74	7421658.88	91	16	18526.744	61916.311
69	39	866135.75	6466330.14	92	17	12639.055	43389.567
70	40	782518.20	5600194.39	93	18	8689.6135	30750.5123
71	41	704282.63	4817676.19	94	19	6146.0915	22060.8988
72	42	628562.79	4113393.56	95	20	4401.2019	15914.8073
73	43	555116.39	3484830.77	96	21	3221.5672	11513.6054
74	44	484894.12	2929714.38	97	22	2407.4184	8292.0382
75	45	417926.54	2444820.26	98	23	1787.8273	5884.6198
76	46	358084.13	2026893.72	99	24	1341.1802	4096.7925
77	47	304281.62	1668809.59	100	25	1047.6398	2755.6123
78	48	257332.61	1364527.97	101	26	777.76074	1707.97247
79	49	217436.25	1107195.36	102	27	530.24047	930.21173
80	50	181795.12	889759.11	103	28	303.53170	399.97126
81	51	151465.77	707963.99	104	29	96.43956	96.43956
82	52	124348.88	556498.22				
83	53	107182.67	432149.34				

Difference of Age 75 years.

COMMUTATION TABLES FOR JOINT ANNUITIES.

Difference of Age 31 years.

AGES.		D_{xy}	N_{xy}	AGES.		D_{xy}	N_{xy}
(x)	(y)			(x)	(y)		
31	0	16557305.	195472574.	85	54	65741.724	255270.283
32	1	13332846.	178915269.	86	55	51252.290	189528.559
33	2	11667281.	165582423.	87	56	39034.729	138276.269
34	3	10384811.	153915142.	88	57	28859.122	99241.540
35	4	9508978.2	143530331.2	89	58	21196.723	70382.418
36	5	8789539.8	134021353.0	90	59	15602.825	49185.695
37	6	8213434.1	125231813.2	91	60	10779.896	33582.870
38	7	7715853.6	117018379.1	92	61	7155.8307	22802.9740
39	8	7271714.4	109302525.5	93	62	4776.7548	15647.1433
40	9	6863535.4	102030811.1	94	63	3274.9759	10870.3885
41	10	6480620.9	95167275.7	95	64	2271.4249	7595.4126
42	11	6117939.9	88686654.8	96	65	1607.8535	5323.9877
43	12	5770137.5	82568714.9	97	66	1160.2113	3716.1342
44	13	5439968.3	76798577.4	98	67	830.80153	2555.92287
45	14	5126629.7	71358609.1	99	68	599.80494	1725.12134
46	15	4829622.5	66231979.4	100	69	449.95586	1125.31640
47	16	4546740.5	61402356.9	101	70	319.98005	675.36054
48	17	4279123.1	56855616.4	102	71	208.41664	355.38049
49	18	4029152.7	52576493.3	103	72	113.16431	146.96385
50	19	3794569.1	48547340.6	104	73	33.79954	33.79954
51	20	3574427.8	44752771.5	Difference of Age 74 years.			
52	21	3363907.3	41178343.7	74	0	1010617.2	4961772.77
53	22	3163233.6	37814436.4	75	1	748059.34	3951155.57
54	23	2971525.2	34651202.8	76	2	598139.67	3203096.23
55	24	2789175.3	31679677.6	77	3	482420.34	2604956.56
56	25	2615149.0	28890502.3	78	4	398321.97	2122536.22
57	26	2448747.1	26275353.3	79	5	331519.56	1724214.25
58	27	2288375.1	23826606.2	80	6	276020.97	1392694.69
59	28	2130419.7	21538231.1	81	7	230236.35	1116673.72
60	29	1973246.1	19407811.4	82	8	190071.15	886437.37
61	30	1815789.1	17434565.3	83	9	156014.97	696366.22
62	31	1666463.9	15618776.2	84	10	126732.40	540351.25
63	32	1526685.9	13952312.3	85	11	102048.04	413618.85
64	33	1397515.9	12425626.4	86	12	80533.92	311570.81
65	34	1277353.2	11028110.5	87	13	62143.288	231036.895
66	35	1165802.4	9750757.3	88	14	46590.860	168893.607
67	36	1062311.5	8584954.9	89	15	34757.771	122302.747
68	37	965812.7	7522643.4	90	16	26057.425	87544.976
69	38	875916.88	6556830.66	91	17	18402.463	61487.551
70	39	791923.84	5680913.78	92	18	12551.664	43085.088
71	40	713562.46	4888989.94	93	19	8629.1126	30533.4239
72	41	637342.30	4175427.48	94	20	6102.9997	21904.3113
73	42	563211.12	3538085.18	95	21	4370.1261	15801.3116
74	43	492069.52	2974874.06	96	22	3199.1915	11431.1855
75	44	424203.84	2482804.54	97	23	2390.5805	8231.9940
76	45	363466.54	2058600.70	98	24	1775.2349	5841.4135
77	46	308857.78	1695134.16	99	25	1331.6666	4066.1786
78	47	261146.21	1386276.38	100	26	1039.9772	2734.5120
79	48	220509.03	1125130.17	101	27	772.03015	1694.53485
80	49	184317.18	904621.14	102	28	526.12157	922.50470
81	50	153525.82	720303.96	103	29	300.89137	396.38313
82	51	126151.88	566778.14	104	30	95.49176	95.49176
83	52	102744.50	440626.26				
84	53	82611.478	337881.761				

Difference of Age 74 years.

COMMUTATION TABLES FOR JOINT ANNUITIES.

Difference of Age 32 years.

AGES.		$D_{x,y}$	$N_{x,y}$	AGES.		$D_{x,y}$	$N_{x,y}$
(x)	(y)			(x)	(y)		
32	0	15758003.	184755081.	86	54	52133.129	193717.062
33	1	12690174.	168997078.	87	55	39747.113	141583.933
34	2	11105780.	156306904.	88	56	29418.065	101836.820
35	3	9884010.9	145201123.7	89	57	21649.126	72418.755
36	4	9049463.0	135317112.8	90	58	15989.878	50769.629
37	5	8362299.4	126267649.8	91	59	11093.557	34779.751
38	6	7811804.6	117905350.4	92	60	7403.775	23686.194
39	7	7336243.1	110093545.8	93	61	4954.0364	16282.4187
40	8	6908989.2	102757302.7	94	62	3402.2470	11328.3823
41	9	6513726.3	95848313.5	95	63	2361.7615	7926.1353
42	10	6145528.2	89334587.2	96	64	1674.4478	5564.3738
43	11	5798086.6	83189059.0	97	65	1209.9232	3889.9260
44	12	5467304.8	77390972.4	98	66	867.6794	2680.0028
45	13	5153335.1	71923667.6	99	67	627.66597	1812.32344
46	14	4856453.7	66770332.5	100	68	471.87449	1184.65747
47	15	4575062.3	61913878.8	101	69	336.50546	712.78298
48	16	4308022.1	57338816.5	102	70	219.76651	376.27752
49	17	4057205.4	53030794.4	103	71	120.24038	156.51101
50	18	3821173.8	48973589.0	104	72	36.27063	36.27063
51	19	3599666.0	45152415.2	Difference of Age 73 years.			
52	20	3387827.9	41552749.2	73	0	1140103.5	5801243.43
53	21	3185357.8	38164921.3	74	1	855083.21	4661139.93
54	22	2992455.0	34979563.5	75	2	687761.92	3806056.72
55	23	2808960.0	31987108.5	76	3	559309.42	3118294.80
56	24	2633831.9	29178148.5	77	4	464115.69	2558985.38
57	25	2466789.7	26544316.6	78	5	386881.17	2094869.69
58	26	2305361.1	24077526.9	79	6	325617.85	1707988.52
59	27	2147098.4	21772165.8	80	7	272630.66	1382370.67
60	28	1990561.4	19625067.4	81	8	228211.22	1109740.01
61	29	1833811.8	17634506.0	82	9	188820.69	881528.79
62	30	1683471.7	15800694.2	83	10	155222.04	692708.10
63	31	1542427.8	14117222.5	84	11	126163.48	537486.06
64	32	1411817.9	12574794.7	85	12	101556.13	411322.58
65	33	1290322.5	11162976.8	86	13	80131.249	309766.455
66	34	1177760.5	9872654.3	87	14	61821.252	229635.206
67	35	1073320.9	8694893.8	88	15	46333.452	167813.954
68	36	976112.75	7621572.94	89	16	34542.604	121480.502
69	37	885529.38	6645460.19	90	17	25882.627	86937.898
70	38	800866.91	5759930.81	91	18	18275.223	61055.271
71	39	722139.26	4959063.90	92	19	12464.274	42780.048
72	40	645740.11	4236924.64	93	20	8568.6117	30315.7740
73	41	571077.84	3591184.53	94	21	6059.9079	21747.1623
74	42	499244.90	3020106.69	95	22	4339.7730	15687.2544
75	43	430481.14	2520861.79	96	23	3176.8159	11347.4814
76	44	368925.84	2090380.65	97	24	2373.7426	8170.6655
77	45	313500.26	1721454.81	98	25	1762.6424	5796.9229
78	46	265073.65	1407954.55	99	26	1321.9266	4034.2805
79	47	223776.92	1142880.90	100	27	1032.3146	2712.3539
80	48	186921.93	919103.98	101	28	766.03303	1680.03926
81	49	155655.70	732182.05	102	29	521.54500	914.00623
82	50	127867.64	576526.35	103	30	297.93421	392.46123
83	51	104234.24	448658.71	104	31	94.52702	94.52702
84	52	83886.649	344424.469				
85	53	66820.758	260537.820				

Difference of Age 73 years.

STATISTICAL TABLES FOR JUVENILE ANNUITIES

Difference of Age 10 years.

Age 10 years.			Age 20 years.		
x	y	N_x	x	y	N_x
10	1	1000000	10	1	1000000
11	1	1000000	11	1	1000000
12	1	1000000	12	1	1000000
13	1	1000000	13	1	1000000
14	1	1000000	14	1	1000000
15	1	1000000	15	1	1000000
16	1	1000000	16	1	1000000
17	1	1000000	17	1	1000000
18	1	1000000	18	1	1000000
19	1	1000000	19	1	1000000
20	1	1000000	20	1	1000000
21	1	1000000	21	1	1000000
22	1	1000000	22	1	1000000
23	1	1000000	23	1	1000000
24	1	1000000	24	1	1000000
25	1	1000000	25	1	1000000
26	1	1000000	26	1	1000000
27	1	1000000	27	1	1000000
28	1	1000000	28	1	1000000
29	1	1000000	29	1	1000000
30	1	1000000	30	1	1000000
31	1	1000000	31	1	1000000
32	1	1000000	32	1	1000000
33	1	1000000	33	1	1000000
34	1	1000000	34	1	1000000
35	1	1000000	35	1	1000000
36	1	1000000	36	1	1000000
37	1	1000000	37	1	1000000
38	1	1000000	38	1	1000000
39	1	1000000	39	1	1000000
40	1	1000000	40	1	1000000
41	1	1000000	41	1	1000000
42	1	1000000	42	1	1000000
43	1	1000000	43	1	1000000
44	1	1000000	44	1	1000000
45	1	1000000	45	1	1000000
46	1	1000000	46	1	1000000
47	1	1000000	47	1	1000000
48	1	1000000	48	1	1000000
49	1	1000000	49	1	1000000
50	1	1000000	50	1	1000000
51	1	1000000	51	1	1000000
52	1	1000000	52	1	1000000
53	1	1000000	53	1	1000000
54	1	1000000	54	1	1000000
55	1	1000000	55	1	1000000
56	1	1000000	56	1	1000000
57	1	1000000	57	1	1000000
58	1	1000000	58	1	1000000
59	1	1000000	59	1	1000000
60	1	1000000	60	1	1000000
61	1	1000000	61	1	1000000
62	1	1000000	62	1	1000000
63	1	1000000	63	1	1000000
64	1	1000000	64	1	1000000
65	1	1000000	65	1	1000000
66	1	1000000	66	1	1000000
67	1	1000000	67	1	1000000
68	1	1000000	68	1	1000000
69	1	1000000	69	1	1000000
70	1	1000000	70	1	1000000
71	1	1000000	71	1	1000000
72	1	1000000	72	1	1000000
73	1	1000000	73	1	1000000
74	1	1000000	74	1	1000000
75	1	1000000	75	1	1000000
76	1	1000000	76	1	1000000
77	1	1000000	77	1	1000000
78	1	1000000	78	1	1000000
79	1	1000000	79	1	1000000
80	1	1000000	80	1	1000000
81	1	1000000	81	1	1000000
82	1	1000000	82	1	1000000
83	1	1000000	83	1	1000000
84	1	1000000	84	1	1000000
85	1	1000000	85	1	1000000
86	1	1000000	86	1	1000000
87	1	1000000	87	1	1000000
88	1	1000000	88	1	1000000
89	1	1000000	89	1	1000000
90	1	1000000	90	1	1000000
91	1	1000000	91	1	1000000
92	1	1000000	92	1	1000000
93	1	1000000	93	1	1000000
94	1	1000000	94	1	1000000
95	1	1000000	95	1	1000000
96	1	1000000	96	1	1000000
97	1	1000000	97	1	1000000
98	1	1000000	98	1	1000000
99	1	1000000	99	1	1000000
100	1	1000000	100	1	1000000

Difference of Age 73 years.

COMMUTATION TABLES FOR JOINT ANNUITIES.

Difference of Age 34 years.

AGES.		D _{xy}	N _{xy}	AGES.		D _{xy}	N _{xy}
(x)	(y)			(x)	(y)		
34	0	14276617.	164806881.	88	54	30469.760	106524.351
35	1	11496923.	150530264.	89	55	22471.175	76054.591
36	2	10059413.	139033341.	90	56	16647.452	53583.416
37	3	8949149.1	128973928.5	91	57	11611.395	36935.964
38	4	8188587.2	120024779.4	92	58	7808.2085	25324.5695
39	5	7562093.4	111836192.2	93	59	5274.8318	17516.3610
40	6	7056978.6	104274098.8	94	60	3650.7764	12241.5292
41	7	6615048.7	97217120.2	95	61	2544.6029	8590.7528
42	8	6217828.5	90602071.5	96	62	1808.7020	6046.1499
43	9	5853984.8	84384243.0	97	63	1310.1488	4237.4479
44	10	5518560.8	78530258.2	98	64	942.3346	2927.2991
45	11	5204318.2	73011697.4	99	65	683.61454	1984.96448
46	12	4906283.1	67807379.2	100	66	515.71178	1301.34994
47	13	4624443.9	62901096.1	101	67	369.28975	785.63816
48	14	4358939.5	58276652.2	102	68	242.37472	416.34841
49	15	4110048.9	53917712.7	103	69	133.33638	173.97369
50	16	3873764.4	49807663.8	104	70	40.63731	40.63731
51	17	3650142.3	45933899.4	Difference of Age 71 years.			
52	18	3435669.1	42283757.1	71	0	1406034.4	7748997.8
53	19	3230659.7	38849088.0	72	1	1076572.8	6342963.4
54	20	3034812.8	35617428.3	73	2	886886.5	5266390.6
55	21	2848529.4	32582615.5	74	3	735122.95	4379504.06
56	22	2671197.5	29734086.1	75	4	618711.65	3644381.11
57	23	2502035.5	27062888.6	76	5	522632.13	3025669.46
58	24	2338938.2	24560853.1	77	6	442760.26	2503037.33
59	25	2178973.2	22221914.9	78	7	375326.53	2060277.07
60	26	2021036.2	20042941.7	79	8	318789.44	1684950.54
61	27	1864386.1	18021905.5	80	9	268454.79	1366161.10
62	28	1715100.2	16157519.4	81	10	225557.60	1097706.31
63	29	1573635.4	14442419.2	82	11	187017.69	872148.71
64	30	1440932.8	12868783.8	83	12	153780.35	685131.02
65	31	1316968.4	11427851.0	84	13	124927.54	531350.67
66	32	1201894.0	10110882.6	85	14	100524.70	406423.13
67	33	1095339.8	8908988.6	86	15	79275.577	305898.432
68	34	996344.97	7813648.85	87	16	61099.109	226622.855
69	35	904248.43	6817303.88	88	17	45737.736	165523.746
70	36	818290.47	5913055.45	89	18	34073.650	119786.010
71	37	738308.66	5094764.98	90	19	25524.706	85712.360
72	38	660881.60	4356456.32	91	20	18020.743	60187.654
73	39	585557.15	3695574.72	92	21	12289.494	42166.911
74	40	512888.23	3110017.57	93	22	8419.017	29877.417
75	41	442858.91	2597129.34	94	23	5975.7286	21428.3998
76	42	379844.45	2154270.43	95	24	4279.0667	15452.6712
77	43	322917.87	1774425.98	96	25	3132.0645	11173.6045
78	44	273099.29	1451508.11	97	26	2339.6659	8041.5400
79	45	230556.56	1178408.82	98	27	1736.8579	5701.8741
80	46	192544.88	947852.26	99	28	1301.9935	3965.0162
81	47	160194.78	755307.38	100	29	1015.3855	2663.0227
82	48	131473.64	595112.60	101	30	751.90646	1647.63718
83	49	107117.63	463638.96	102	31	511.20198	895.73072
84	50	86260.43	356521.33	103	32	291.91427	384.52874
85	51	68836.012	270260.900	104	33	92.61447	92.61447
86	52	53806.726	201424.888				
87	53	41093.811	147618.162				

Difference of Age 71 years.

COMMUTATION TABLES FOR JOINT ANNUITIES.

Difference of Age 35 years.

AGES.		D_{xy}	N_{xy}	AGES.		D_{xy}	N_{xy}
(x)	(y)			(x)	(y)		
35	0	13588137.	155526003.1	89	54	22857.372	77703.564
36	1	10941341.	141937866.1	90	55	16951.268	54846.192
37	2	9570446.9	130996525.1	91	56	11836.284	37894.924
38	3	8511543.8	121426078.2	92	57	7974.8594	26058.6403
39	4	7785718.7	112914534.4	93	58	5405.6825	18083.7809
40	5	7184883.7	105128815.7	94	59	3757.0026	12678.0984
41	6	6697310.5	97943932.0	95	60	2632.7715	8921.0958
42	7	6273005.1	91246621.5	96	61	1875.8290	6288.3243
43	8	5892752.9	84973616.4	97	62	1361.0634	4412.4953
44	9	5546751.6	79080863.5	98	63	979.81212	3051.43192
45	10	5227786.6	73534111.9	99	64	711.92860	2071.61980
46	11	4930047.9	68306325.3	100	65	537.80862	1359.69120
47	12	4647682.4	63376277.4	101	66	385.68190	821.88258
48	13	4381645.9	58728595.0	102	67	253.63307	436.20068
49	14	4132882.5	54346949.1	103	68	139.83158	182.56761
50	15	3897894.2	50214066.6	104	69	42.73603	42.73603
51	16	3674793.5	46316172.4	Difference of Age 70 years.			
52	17	3459589.8	42641378.9	70	0	1541907.8	8857040.56
53	18	3253310.7	39181789.1	71	1	1189645.7	7315132.76
54	19	3056240.8	35928478.4	72	2	989795.52	6125487.06
55	20	2868785.2	32872237.6	73	3	829311.28	5135691.54
56	21	2689880.3	30003452.4	74	4	707229.91	4306380.26
57	22	2519658.4	27313572.1	75	5	600940.71	3599150.35
58	23	2355529.2	24793913.7	76	6	513328.25	2998209.64
59	24	2194539.9	22438384.5	77	7	437321.93	2484881.39
60	25	2035927.3	20243844.6	78	8	372025.20	2047559.46
61	26	1878225.0	18207917.3	79	9	316692.14	1675534.26
62	27	1728527.4	16329692.3	80	10	267090.39	1358842.12
63	28	1587444.1	14601164.9	81	11	224545.04	1091751.73
64	29	1455234.9	13013720.8	82	12	186116.19	867206.69
65	30	1330409.3	11558485.9	83	13	153011.45	681090.50
66	31	1214286.9	10228076.6	84	14	124280.15	528079.05
67	32	1106549.4	9013789.7	85	15	99969.313	403798.905
68	33	1006461.1	7907240.3	86	16	78784.823	303829.592
69	34	913523.64	6900779.23	87	17	60689.244	225044.769
70	35	826770.96	5987255.59	88	18	45421.492	164355.525
71	36	746182.45	5160484.63	89	19	33836.414	118934.033
72	37	668134.25	4414302.18	90	20	25345.746	85097.619
73	38	592169.75	3746167.93	91	21	17893.503	59751.873
74	39	519052.99	3153998.18	92	22	12204.136	41858.370
75	40	448694.14	2634945.19	93	23	8389.9231	29654.2344
76	41	385149.97	2186251.05	94	24	5933.6389	21264.3113
77	42	327626.68	1801101.08	95	25	4248.7136	15330.6724
78	43	277140.56	1473474.40	96	26	3109.1560	11081.9588
79	44	234019.54	1196333.84	97	27	2322.4271	7972.8028
80	45	195439.05	962314.30	98	28	1723.3660	5650.3757
81	46	162603.99	766875.25	99	29	1290.6679	3927.0097
82	47	133422.04	604271.26	100	30	1005.4063	2636.3418
83	48	108631.40	470849.22	101	31	744.3101	1630.9355
84	49	87457.129	362217.816	102	32	505.98469	886.62539
85	50	69772.233	274760.687	103	33	288.95711	380.64070
86	51	54586.897	204988.454	104	34	91.68359	91.68359
87	52	41728.125	150401.557				
88	53	30969.868	108673.432				

Difference of Age 70 years.

COMMUTATION TABLES FOR JOINT ANNUITIES.

Difference of Age 36 years.

AGES.		D _{x,y}	N _{x,y}	AGES.		D _{x,y}	N _{x,y}
(x)	(y)			(x)	(y)		
36	0	12931499.	146677938.2	90	54	17242.599	56033.708
37	1	10409507.	133746439.2	91	55	12052.297	38791.109
38	2	9102460.7	123336932.2	92	56	8129.3164	26738.8119
39	3	8092786.2	114234471.5	93	57	5521.0562	18609.4955
40	4	7397354.1	106141685.3	94	58	3850.2012	13088.4393
41	5	6818696.7	98744331.2	95	59	2709.3770	9238.2381
42	6	6351013.3	91925634.5	96	60	1940.8251	6528.8611
43	7	5945044.8	85574621.2	97	61	1411.5771	4588.0360
44	8	5583485.1	79629576.4	98	62	1017.8893	3176.4589
45	9	5254492.0	74046091.3	99	63	740.24266	2158.56965
46	10	4952279.5	68791599.3	100	64	560.08366	1418.32699
47	11	4670194.6	63839319.8	101	65	402.20732	858.24333
48	12	4403664.2	59169125.2	102	66	264.89140	456.03601
49	13	4154411.3	54765461.0	103	67	146.32678	191.14461
50	14	3919549.2	50611049.7	104	68	44.81783	44.81783
51	15	3697683.9	46691500.5	Difference of Age 69 years.			
52	16	3482954.1	42993816.6	69	0	1686401.4	10061879.7
53	17	3275961.7	39510862.5	70	1	1304608.2	8375478.3
54	18	3077668.9	36234900.8	71	2	1093754.2	7070870.1
55	19	2889041.0	33157231.9	72	3	925539.62	5977115.93
56	20	2709007.9	30268190.9	73	4	797844.42	5051576.31
57	21	2537281.3	27559183.0	74	5	686916.50	4253731.89
58	22	2372120.2	25021901.7	75	6	590242.78	3566815.39
59	23	2210106.6	22649781.5	76	7	507023.14	2976572.61
60	24	2050472.1	20439674.9	77	8	433475.30	2469549.47
61	25	1892063.8	18389202.8	78	9	369577.67	2036074.17
62	26	1741357.8	16497139.0	79	10	315082.59	1666496.50
63	27	159871.9	14755781.2	80	11	265891.38	1351413.91
64	28	1468004.6	13155909.3	81	12	223462.64	1085522.53
65	29	1343614.3	11687904.7	82	13	185185.60	862059.89
66	30	1226679.8	10344290.4	83	14	152218.52	676874.29
67	31	1117959.2	9117610.6	84	15	123593.52	524655.77
68	32	1016761.1	7999651.4	85	16	99350.456	401062.246
69	33	922798.85	6982890.33	86	17	78256.320	301711.790
70	34	835251.46	6060091.48	87	18	60269.621	223455.470
71	35	753915.65	5224840.02	88	19	45105.248	163185.849
72	36	675259.66	4470924.37	89	20	33599.179	118080.601
73	37	598668.35	3795664.71	90	21	25166.786	84481.422
74	38	524914.57	3196996.36	91	22	17769.222	59314.636
75	39	454087.31	2672081.79	92	23	12118.778	41545.414
76	40	390224.81	2217994.48	93	24	8330.8292	29426.6357
77	41	332202.84	1827769.67	94	25	5891.5493	21095.8065
78	42	281181.84	1495566.83	95	26	4217.6378	15204.2572
79	43	237482.52	1214384.99	96	27	3086.2476	10986.6194
80	44	198374.57	976902.47	97	28	2304.3865	7900.3718
81	45	165048.11	778527.90	98	29	1708.3750	5595.9853
82	46	135428.61	613479.79	99	30	1277.9832	3887.6103
83	47	110241.29	478051.18	100	31	995.2489	2609.6271
84	48	88693.063	367809.889	101	32	736.71374	1614.37816
85	49	70740.190	279116.826	102	33	500.85895	877.66442
86	50	55329.319	208376.636	103	34	286.05276	376.80547
87	51	42333.163	153047.317	104	35	90.75271	90.75271
88	52	31447.911	110714.154				
89	53	23232.535	79266.243				

Difference of Age 69 years.

COMMUTATION TABLES FOR JOINT ANNUITIES.

Difference of Age 37 years.

AGES.		$D_{x,y}$	$N_{x,y}$	AGES.		$D_{x,y}$	$N_{x,y}$
(x)	(y)			(x)	(y)		
37	0	12372927.	138242000.	91	54	12250.431	39633.707
38	1	9900491.	125039153.	92	55	8277.5764	27374.2761
39	2	8654630.7	116038661.9	93	56	5627.9880	19096.5897
40	3	7689104.7	107384031.2	94	57	3932.3761	13468.6117
41	4	7020338.3	99694926.5	95	58	2776.5875	9536.2356
42	5	6466123.0	92674588.2	96	59	1997.2971	6759.6481
43	6	6018374.6	86208465.2	97	60	1460.4871	4762.3510
44	7	5633032.5	80189490.6	98	61	1055.6666	3301.8639
45	8	5289290.0	74566458.1	99	62	769.00973	2246.19733
46	9	4977577.6	69267168.1	100	63	562.35871	1477.18760
47	10	4691254.4	64289590.5	101	64	418.86801	894.82889
48	11	4424994.4	59598336.1	102	65	276.24128	475.96288
49	12	4175287.7	55173341.7	103	66	152.82198	199.72160
50	13	3939966.7	50998054.0	104	67	46.89462	46.89462
51	14	3718226.6	47058087.3	Difference of Age 68 years.			
52	15	3504649.5	43339860.7	68	0	1839292.9	11369592.4
53	16	3294085.9	39835211.2	69	1	1426864.2	9530299.5
54	17	3099097.0	36537125.3	70	2	1199450.1	8103435.3
55	18	2909296.8	33438028.3	71	3	1022749.4	6903985.2
56	19	2728135.6	30528731.5	72	4	890421.54	5881235.82
57	20	2555323.9	27800695.9	73	5	774928.34	4990814.28
58	21	2388711.2	25245272.0	74	6	674688.04	4215885.94
59	22	2225673.4	22856560.8	75	7	582992.94	3541197.90
60	23	2065017.0	20630887.4	76	8	502563.43	2958204.96
61	24	1905580.9	18565870.4	77	9	430623.49	2455641.53
62	25	1754188.2	16660289.5	78	10	367699.33	2025018.04
63	26	1611747.3	14906101.3	79	11	313668.13	1657318.71
64	27	1479497.3	13294354.0	80	12	264609.68	1343650.58
65	28	1355404.5	11814856.7	81	13	222345.33	1079040.90
66	29	1238855.3	10459452.2	82	14	184225.94	856695.57
67	30	1120369.0	9220596.9	83	15	151377.53	672469.63
68	31	1027245.1	8091227.9	84	16	122828.42	521092.10
69	32	932242.69	7063082.83	85	17	98683.993	398263.685
70	33	843731.94	6131740.14	86	18	77715.233	299579.692
71	34	761648.83	5288008.20	87	19	59849.998	221864.459
72	35	682257.83	4526359.37	88	20	44789.004	162014.461
73	36	605052.92	3844101.54	89	21	33361.943	117225.457
74	37	530675.09	3239042.62	90	22	24991.988	83863.514
75	38	459215.25	2708373.53	91	23	17644.941	58871.526
76	39	394915.20	2249158.28	92	24	12033.421	41226.585
77	40	336580.04	1854243.08	93	25	8271.7354	29193.1641
78	41	285109.28	1517663.04	94	26	5848.4575	20921.4287
79	42	240945.51	1232553.76	95	27	4186.5620	15072.9712
80	43	201310.08	991608.25	96	28	3062.2736	10886.4092
81	44	167527.15	790298.17	97	29	2284.3414	7824.1356
82	45	137464.25	622771.02	98	30	1691.5851	5539.7942
83	46	111899.23	485306.77	99	31	1265.0720	3848.2091
84	47	90007.471	373407.538	100	32	985.09148	2583.13709
85	48	71739.883	283400.067	101	33	729.25065	1598.04561
86	49	56096.908	211660.184	102	34	495.82473	868.79496
87	50	42908.926	155563.276	103	35	283.14840	372.97023
88	51	31903.891	112654.350	104	36	89.82183	89.82183
89	52	23591.147	80750.459				
90	53	17525.605	57159.312				

Difference of Age 68 years.

COMMUTATION TABLES FOR JOINT ANNUITIES.

Difference of Age 38 years.

AGES.		D _{x,y}	N _{x,y}	AGES.		D _{x,y}	N _{x,y}
(x)	(y)			(x)	(y)		
38	0	11701325.	130200959.1	92	54	8419.9395	27971.1950
39	1	9413399.	118499634.1	93	55	5730.6988	19551.2555
40	2	8222923.4	109086235.1	94	56	4008.5384	13820.5567
41	3	7297219.3	100863311.7	95	57	2835.8483	9812.0183
42	4	6657338.4	93566092.4	96	58	2046.8433	6976.1700
43	5	6128066.3	86908754.0	97	59	1502.9828	4929.3267
44	6	5703082.4	80780687.7	98	60	1092.2447	3426.3439
45	7	5336226.7	75077605.3	99	61	797.5503	2334.0992
46	8	5010541.6	69741378.6	100	62	604.99015	1536.54892
47	9	4715219.0	64730837.0	101	63	435.52470	931.55877
48	10	4444948.5	60015618.0	102	64	287.68268	496.03407
49	11	4195511.8	55570669.5	103	65	159.36998	208.35139
50	12	3959765.6	51375157.7	104	66	48.98141	48.98141
51	13	3737595.5	47415392.1	Difference of Age 67 years.			
52	14	3524119.8	43677796.6	67	0	2001717.5	12787043.2
53	15	3318629.8	40153676.8	68	1	1556225.7	10785325.7
54	16	3120026.7	36835047.0	69	2	1311851.6	9229100.0
55	17	2929552.6	33715020.3	70	3	1121583.7	7917248.4
56	18	2747263.2	30785467.7	71	4	983942.88	6795664.72
57	19	2573366.4	28038204.5	72	5	864846.41	5811721.84
58	20	2405697.3	25464838.1	73	6	761133.09	4946875.43
59	21	2241240.1	23059140.8	74	7	666400.98	4185742.34
60	22	2079561.8	20817900.7	75	8	577865.01	3519341.36
61	23	1919097.9	18738338.9	76	9	499257.09	2941476.35
62	24	1766720.3	16819241.0	77	10	428434.89	2442219.26
63	25	1623622.8	15052520.7	78	11	366048.67	2013784.37
64	26	1490479.3	13428897.9	79	12	312156.12	1647735.70
65	27	1366015.7	11938418.6	80	13	263286.63	1335579.58
66	28	1249726.2	10572402.9	81	14	221193.10	1072292.95
67	29	1140578.6	9322676.7	82	15	183208.12	851099.85
68	30	1037729.0	8182098.1	83	16	150440.43	667891.73
69	31	941855.18	7144369.08	84	17	122004.46	517451.30
70	32	852366.64	6202513.90	85	18	98001.663	395446.845
71	33	769382.03	5350147.26	86	19	77174.145	297445.182
72	34	689255.99	4580765.23	87	20	59430.375	220271.037
73	35	611323.49	3891509.24	88	21	44472.759	160840.662
74	36	536334.55	3280185.75	89	22	33130.224	116367.903
75	37	464254.77	2743851.20	90	23	24817.190	83237.679
76	38	399374.91	2279596.43	91	24	17520.660	58420.489
77	39	340625.63	1880221.52	92	25	11948.063	40899.829
78	40	288865.96	1539595.89	93	26	8211.2345	28951.7656
79	41	244310.94	1250729.93	94	27	5805.3657	20740.5311
80	42	204245.59	1006418.99	95	28	4154.0408	14935.1654
81	43	170006.19	802173.40	96	29	3035.6359	10781.1246
82	44	139528.98	632167.21	97	30	2261.8909	7745.4887
83	45	113581.21	492638.23	98	31	1674.4953	5483.5978
84	46	91361.114	379057.017	99	32	1252.1608	3809.1025
85	47	72803.049	287695.903	100	33	975.11226	2556.94166
86	48	56889.663	214892.854	101	34	721.92083	1581.82940
87	49	43504.205	158003.191	102	35	490.79050	859.90857
88	50	32337.808	114498.986	103	36	280.24405	369.11807
89	51	23933.208	82161.178	104	37	88.87402	88.87402
90	52	17796.127	58227.970				
91	53	12460.648	40431.843				

Difference of Age 67 years.

COMMUTATION TABLES FOR JOINT ANNUITIES.

Difference of Age 39 years.

AGES.		D_{xy}	N_{xy}	AGES.		D_{xy}	N_{xy}
(x)	(y)			(x)	(y)		
39	0	11125634.	122537492.8	93	54	5829.1886	19977.7305
40	1	8943843.1	111411858.8	94	55	4081.6942	14148.5419
41	2	7803831.3	102468015.7	95	56	2890.7730	10066.8477
42	3	6919002.8	94664184.4	96	57	2090.5292	7176.0747
43	4	6309284.7	87744281.6	97	58	1540.2667	5085.5455
44	5	5806448.6	81434996.9	98	59	1124.0256	3545.2788
45	6	5402585.6	75628548.3	99	60	825.18482	2421.25316
46	7	5055004.8	70225962.7	100	61	627.44340	1596.06834
47	8	4746445.6	65170957.9	101	62	452.44992	968.62494
48	9	4467654.9	60424512.3	102	63	299.12409	516.17502
49	10	4214431.1	55956857.4	103	64	165.97080	217.05093
50	11	3978945.7	51742426.3	104	65	51.08013	51.08013
51	12	3756377.3	47763480.6	Difference of Age 66 years.			
52	13	3542477.5	44007103.3	66	0	2174193.2	14321163.3
53	14	3337066.6	40464625.8	67	1	1693653.2	12146970.1
54	15	3139461.5	37127559.2	68	2	1430785.9	10453316.9
55	16	2949337.3	33988097.7	69	3	1226688.4	9022531.0
56	17	2766390.9	31038760.4	70	4	1079027.1	7795842.6
57	18	2591408.9	28272369.5	71	5	955681.58	6716815.49
58	19	2422683.3	25680960.6	72	6	849450.44	5761133.91
59	20	2257177.5	23258277.3	73	7	751784.24	4911683.47
60	21	2094106.6	21001099.8	74	8	660539.40	4159899.23
61	22	1932615.0	18906993.2	75	9	574063.27	3499359.83
62	23	1779252.3	16974378.2	76	10	496719.66	2925296.56
63	24	1635222.0	15195125.9	77	11	426511.57	2428576.90
64	25	1501461.2	13559903.9	78	12	364284.17	2002065.33
65	26	1376155.4	12058442.7	79	13	310595.34	1637781.16
66	27	1259510.1	10682287.3	80	14	261922.23	1327185.82
67	28	1150587.2	9422777.2	81	15	219971.04	1065263.59
68	29	1048029.1	8272190.0	82	16	182073.97	845292.55
69	30	951467.67	7224160.91	83	17	149431.25	663218.58
70	31	861155.50	6272693.24	84	18	121160.88	513787.33
71	32	777255.82	5411537.74	85	19	97319.332	392626.447
72	33	696254.16	4634281.92	86	20	76633.058	295307.115
73	34	617594.06	3938027.76	87	21	59010.751	218674.057
74	35	541892.94	3320433.70	88	22	44163.870	159663.306
75	36	469205.87	2778540.76	89	23	32898.506	115499.436
76	37	403757.73	2309334.89	90	24	24642.391	82600.930
77	38	344472.26	1905577.16	91	25	17396.379	57958.539
78	39	292338.04	1561104.90	92	26	11860.673	40562.160
79	40	247530.05	1268766.86	93	27	8150.7336	28701.4869
80	41	207098.42	1021236.81	94	28	5760.2697	20550.7533
81	42	172485.23	814138.39	95	29	4117.9061	14790.4836
82	43	141593.70	641653.16	96	30	3005.8016	10672.5775
83	44	115287.21	500059.46	97	31	2239.0395	7666.7759
84	45	92734.375	384772.249	98	32	1657.4056	5427.7364
85	46	73897.951	292037.874	99	33	1239.4761	3770.3308
86	47	57732.753	218139.923	100	34	965.31124	2530.85470
87	48	44119.002	160407.170	101	35	714.59101	1565.54346
88	49	32786.433	116288.168	102	36	485.75629	850.95245
89	50	24258.717	83501.735	103	37	277.28688	365.19616
90	51	18054.162	59243.018	104	38	87.90928	87.90928
91	52	12652.988	41188.856				
92	53	8558.1378	28535.8683				

Difference of Age 66 years.

COMMUTATION TABLES FOR JOINT ANNUITIES.

Difference of Age 40 years.

AGES.		D_{xy}	N_{xy}	AGES.		D_{xy}	N_{xy}
(x)	(y)			(x)	(y)		
40	0	10570669.	115234708.3	94	54	4151.8437	14455.5782
41	1	8488008.3	104664039.3	95	55	2943.5296	10303.7345
42	2	7400319.4	96176031.0	96	56	2131.0185	7360.2049
43	3	6558121.9	88775711.6	97	57	1573.1407	5229.1864
44	4	5978156.1	82217589.7	98	58	1151.9089	3656.0457
45	5	5500505.5	76239433.6	99	59	849.19514	2504.13680
46	6	5117866.6	70738928.1	100	60	649.18383	1654.94166
47	7	4788565.2	65621061.5	101	61	469.24187	1005.75783
48	8	4497242.1	60832496.3	102	62	310.74856	536.51596
49	9	4235959.9	56335254.2	103	63	172.57161	225.76740
50	10	3996888.4	52099294.3	104	64	53.19579	53.19579
51	11	3774572.3	48102405.9	Difference of Age 65 years.			
52	12	3560278.9	44327833.6	65	0	2358045.5	15979889.8
53	13	3354449.9	40767554.7	66	1	1839584.9	13621844.3
54	14	3156902.9	37413104.8	67	2	1557136.0	11782259.4
55	15	2967708.9	34256201.9	68	3	1337901.7	10225123.4
56	16	2785073.7	31288493.0	69	4	1180143.7	8887221.7
57	17	2609451.4	28503419.3	70	5	1048034.7	7707078.0
58	18	2439669.3	25893967.9	71	6	938668.56	6659043.28
59	19	2273114.9	23454298.6	72	7	839016.80	5720374.72
60	20	2108997.7	21181183.7	73	8	745171.64	4881357.92
61	21	1946132.0	19072186.0	74	9	656193.75	4136186.28
62	22	1791784.4	17126054.0	75	10	571145.65	3479992.53
63	23	1646821.3	15334269.6	76	11	494489.81	2908846.88
64	24	1512187.7	13687448.3	77	12	424455.62	2414357.07
65	25	1386294.9	12175260.6	78	13	362462.74	1989901.45
66	26	1268859.2	10788965.7	79	14	308985.79	1627438.71
67	27	1159594.9	9520106.5	80	15	260475.15	1318452.92
68	28	1057225.5	8360511.6	81	16	218609.31	1057977.77
69	29	960911.51	7303286.07	82	17	180852.59	839368.46
70	30	869944.38	6342374.56	83	18	148398.04	658515.87
71	31	785270.22	5472430.18	84	19	120317.31	510117.83
72	32	703379.57	4687159.96	85	20	96637.003	389800.522
73	33	623864.63	3983780.39	86	21	76091.971	293163.519
74	34	547451.34	3359915.76	87	22	58600.887	217071.548
75	35	474068.57	2812464.42	88	23	43854.980	158470.661
76	36	408063.66	2338395.85	89	24	32666.787	114615.681
77	37	348252.57	1930332.19	90	25	24467.593	81948.894
78	38	295639.37	1582079.62	91	26	17269.139	57481.301
79	39	250505.29	1286440.25	92	27	11773.282	40212.162
80	40	209827.20	1035934.96	93	28	8087.4188	28438.8797
81	41	174894.43	826107.76	94	29	5710.1630	20351.4609
82	42	143658.43	651213.33	95	30	4077.4353	14641.2979
83	43	116993.21	507554.90	96	31	2975.4346	10563.8626
84	44	94127.255	390561.693	97	32	2216.1880	7588.4280
85	45	75008.721	296434.438	98	33	1640.6156	5372.2400
86	46	58601.010	221425.717	99	34	1227.0179	3731.6244
87	47	44772.834	162824.707	100	35	955.51022	2504.60648
88	48	33249.768	118051.873	101	36	707.26119	1549.09626
89	49	24595.261	84802.105	102	37	480.63054	841.83507
90	50	18299.712	60206.844	103	38	274.27691	361.20453
91	51	12836.450	41907.132	104	39	86.92762	86.92762
92	52	8690.2392	29070.6818				
93	53	5924.8644	20380.4426				

Difference of Age 65 years.

COMMUTATION TABLES FOR JOINT ANNUITIES.

Difference of Age 41 years.

AGES.		D_{xy}	N_{xy}	AGES.		D_{xy}	N_{xy}
(x)	(y)			(x)	(y)		
41	0	10031921.	108280394.8	95	54	2994.1181	10524.8366
42	1	8049119.8	98248473.8	96	55	2169.9096	7530.7185
43	2	7013421.8	90199354.0	97	56	1603.6093	5360.8089
44	3	6213933.7	83185932.2	98	57	1176.4941	3757.1996
45	4	5663165.7	76971998.5	99	58	870.26079	2580.70555
46	5	5210626.0	71308832.8	100	59	668.07307	1710.44476
47	6	4848113.7	66098206.8	101	60	485.50075	1042.37169
48	7	4537150.3	61250093.1	102	61	322.28149	556.87094
49	8	4264012.6	56712942.8	103	62	179.27803	234.58945
50	9	4017305.9	52448930.2	104	63	55.31142	55.31142
51	10	3791593.4	48431624.3	Difference of Age 64 years.			
52	11	3577524.0	44640030.9	64	0	2553939.8	17771398.0
53	12	3371306.4	41062506.9	65	1	1995142.3	15217458.2
54	13	3173347.7	37691200.5	66	2	1691304.9	13222315.9
55	14	2984196.1	34517852.8	67	3	1456049.3	11531011.0
56	15	2802422.0	31533656.7	68	4	1287137.2	10074961.7
57	16	2627074.3	28731234.7	69	5	1146247.0	8787824.5
58	17	2456655.4	26104160.4	70	6	1029377.6	7641577.5
59	18	2289052.3	23647505.0	71	7	927139.08	6612199.33
60	19	2123888.8	21358452.7	72	8	831636.91	5685060.85
61	20	1959970.9	19234563.9	73	9	740269.20	4853423.94
62	21	1804316.4	17274593.0	74	10	652858.71	4113154.74
63	22	1658420.6	15470276.6	75	11	568581.68	3460296.03
64	23	1522914.3	13811856.0	76	12	492106.17	2891714.35
65	24	1396198.7	12288941.7	77	13	422333.34	2399608.18
66	25	1278208.2	10892743.0	78	14	360584.40	1977274.84
67	26	1168202.3	9614534.8	79	15	307278.68	1616690.44
68	27	1065502.4	8446332.5	80	16	258862.68	1309411.76
69	28	969343.53	7380830.10	81	17	217142.84	1050549.08
70	29	878579.07	6411486.57	82	18	179602.12	833406.24
71	30	793284.61	5532907.50	83	19	147364.83	653804.12
72	31	710632.21	4739622.89	84	20	119473.74	506439.29
73	32	630249.21	4028990.68	85	21	95954.673	386965.555
74	33	553009.73	3398741.47	86	22	75563.467	291010.882
75	34	478931.26	2845731.74	87	23	58191.022	215447.415
76	35	412292.70	2366800.48	88	24	43546.090	157256.393
77	36	351966.55	1954507.78	89	25	32435.069	113710.303
78	37	298883.77	1602541.23	90	26	24288.633	81275.234
79	38	253334.20	1303657.46	91	27	17141.899	56986.601
80	39	212349.27	1050323.26	92	28	11681.828	39844.702
81	40	177198.89	837973.99	93	29	8017.0689	28162.8744
82	41	145665.00	660775.10	94	30	5654.0435	20145.8055
83	42	118699.21	515110.10	95	31	4036.2418	14491.7620
84	43	95520.134	396410.893	96	32	2945.0676	10455.5202
85	44	76135.359	300890.759	97	33	2193.7375	7510.4526
86	45	59481.849	224755.400	98	34	1624.1255	5316.7151
87	46	45446.183	165273.551	99	35	1214.5597	3692.5896
88	47	33742.520	119827.368	100	36	945.7092	2478.0299
89	48	24942.838	86084.848	101	37	699.79809	1532.32066
90	49	18553.586	61142.010	102	38	475.41325	832.52257
91	50	13011.036	42588.424	103	39	271.21413	357.10932
92	51	8816.2436	29577.3881	104	40	85.89519	85.89519
93	52	6016.3192	20761.1445				
94	53	4219.9887	14744.8253				

Difference of Age 64 years.

COMMUTATION TABLES FOR JOINT ANNUITIES.

Difference of Age 42 years.

AGES.		D _{xy}	N _{xy}	AGES.		D _{xy}	N _{xy}
(x)	(y)			(x)	(y)		
42	0	9513201.5	101667531.1	96	54	2207.2024	7689.3066
43	1	7628302.0	92154329.6	97	55	1632.8751	5482.1042
44	2	6645338.2	84526027.6	98	56	1199.2804	3849.2291
45	3	5886520.1	77880689.4	99	57	888.83482	2649.94871
46	4	5364714.0	71994169.3	100	58	684.64570	1761.11389
47	5	4935983.9	66629455.3	101	59	499.62732	1076.46819
48	6	4593572.2	61693471.4	102	60	333.44830	576.84087
49	7	4301851.1	57099899.2	103	61	185.93165	243.39257
50	8	4043910.6	52798048.1	104	62	57.46092	57.46092
51	9	3810962.2	48754137.5	Difference of Age 63 years.			
52	10	3593656.5	44943175.3	63	0	2761732.9	19703379.2
53	11	3387636.2	41349518.8	64	1	2160888.5	16941646.3
54	12	3189294.2	37961882.6	65	2	1834323.6	14780757.8
55	13	2999741.3	34772588.4	66	3	1581508.1	12946434.2
56	14	2817991.0	31772847.1	67	4	1400801.9	11364926.1
57	15	2643438.5	28954856.1	68	5	1250167.4	9964124.2
58	16	2473246.4	26311417.6	69	6	1125841.6	8713956.8
59	17	2304989.6	23838171.2	70	7	1016734.0	7588115.2
60	18	2138779.9	21533181.6	71	8	918984.08	6571381.22
61	19	1973809.8	19394401.7	72	9	826165.62	5652397.14
62	20	1817146.9	17420591.9	73	10	736506.86	4826231.52
63	21	1670019.9	15603445.0	74	11	649327.92	4089724.66
64	22	1533640.8	13933425.1	75	12	565840.89	3439796.74
65	23	1406102.5	12399784.3	76	13	489645.64	2873955.85
66	24	1287339.8	10993681.8	77	14	420144.74	2384310.21
67	25	1176809.7	9706342.0	78	15	358592.23	1964165.47
68	26	1073411.3	8529532.3	79	16	305376.48	1605573.24
69	27	976932.33	7456121.00	80	17	257126.18	1300196.76
70	28	886283.61	6479188.67	81	18	215641.45	1043070.58
71	29	801158.40	5592900.06	82	19	178351.65	827429.13
72	30	717884.87	4791741.66	83	20	146331.62	649077.48
73	31	636747.80	4073856.79	84	21	118630.16	502745.86
74	32	558669.18	3437108.99	85	22	95288.211	384115.701
75	33	483793.96	2878439.81	86	23	75034.962	288827.490
76	34	416521.74	2394645.85	87	24	57781.157	213792.528
77	35	355614.22	1978124.11	88	25	43237.201	156011.371
78	36	302071.26	1622509.89	89	26	32197.833	112774.170
79	37	256114.34	1320438.63	90	27	24109.673	80576.337
80	38	214747.29	1064324.29	91	28	17008.741	56466.664
81	39	179328.77	849577.00	92	29	11580.211	39457.923
82	40	147584.32	670248.23	93	30	7938.271	27877.7125
83	41	120357.15	522663.91	94	31	5596.9218	19939.4354
84	42	96913.014	402306.763	95	32	3995.0483	14342.5136
85	43	77261.998	305393.749	96	33	2915.2333	10347.4653
86	44	60375.272	228131.751	97	34	2171.6879	7432.2320
87	45	46129.291	167756.479	98	35	1607.6354	5260.5441
88	46	34249.982	121627.188	99	36	1202.1015	3652.9087
89	47	25312.485	87377.206	100	37	935.72999	2450.80723
90	48	18815.783	62064.721	101	38	692.20173	1515.07724
91	49	13191.539	43248.938	102	39	470.10445	822.87551
92	50	8936.151	30057.399	103	40	267.99293	352.77106
93	51	6103.553	21121.248	104	41	84.77813	84.77813
94	52	4285.1275	15017.6954				
95	53	3043.2613	10732.5679				

Difference of Age 63 years.

COMMUTATION TABLES FOR JOINT ANNUITIES.

Difference of Age 43 years.

AGES.		D_{xy}	N_{xy}	AGES.		D_{xy}	N_{xy}
x	y			x	y		
43	0	9015839.8	95385512.7	97	54	1660.9383	5594.5530
44	1	7227947.8	86369672.9	98	55	1221.1673	3933.6147
45	2	6295193.8	79141725.1	99	56	906.04976	2712.44743
46	3	5576297.4	72846531.3	100	57	699.25814	1806.39767
47	4	5081950.2	67270233.9	101	58	512.02138	1107.13953
48	5	4676829.0	62188283.7	102	59	343.15062	595.11815
49	6	4355347.0	57511454.7	103	60	192.37404	251.96753
50	7	4079795.9	53156107.7	104	61	59.59349	59.59349
51	8	3836200.4	49076311.8	Difference of Age 62 years.			
52	9	3612014.2	45240111.4	62	0	2983820.8	21785719.0
53	10	3402912.4	41628097.2	63	1	2336702.2	18801898.2
54	11	3204742.4	38225184.8	64	2	1986709.8	16465196.0
55	12	3014815.4	35020442.4	65	3	1715242.3	14478486.2
56	13	2832670.4	32005627.0	66	4	1521500.4	12763243.9
57	14	2658124.2	29172956.6	67	5	1360567.4	11241743.5
58	15	2488652.3	26514832.4	68	6	1227911.9	9881176.1
59	16	2320556.4	24026180.1	69	7	1112013.1	8653264.2
60	17	2153671.0	21705623.7	70	8	1007790.9	7541251.1
61	18	1987648.6	19551952.7	71	9	912938.14	6533460.24
62	19	1829977.3	17564304.1	72	10	821966.72	5620522.10
63	20	1681895.3	15734326.8	73	11	733200.56	4798555.38
64	21	1544367.4	14052431.5	74	12	646795.01	4065354.82
65	22	14 6006.3	12508064.1	75	13	563011.68	3418559.81
66	23	1296471.4	11092057.8	76	14	487108.22	2855548.13
67	24	1185216.9	9795586.4	77	15	417823.50	2368439.91
68	25	1081320.3	8610369.5	78	16	356372.37	1950616.41
69	26	984183.85	7529049.25	79	17	303327.96	1594244.04
70	27	893227.19	6544865.40	80	18	255348.34	1290916.08
71	28	808188.58	5651638.21	81	19	214140.06	1035567.74
72	29	725010.28	4843449.63	82	20	177101.18	821427.68
73	30	643246.39	4118439.35	83	21	145298.40	644326.50
74	31	564429.71	3475192.96	84	22	117806.20	499028.10
75	32	488745.07	2910763.25	85	23	94621.748	381221.903
76	33	420750.77	2422018.18	86	24	74506.458	286600.155
77	34	359261.89	2001267.41	87	25	57371.293	212093.697
78	35	305201.83	1642005.52	88	26	42920.957	154722.404
79	36	258845.71	1336803.69	89	27	31960.598	111801.447
80	37	217103.97	1077957.98	90	28	23922.389	79840.849
81	38	181353.90	860854.01	91	29	16860.787	55918.460
82	39	149358.24	679500.11	92	30	11466.401	39057.673
83	40	121943.01	530141.87	93	31	7858.0783	27591.2717
84	41	98266.657	408198.865	94	32	5539.8001	19733.1934
85	42	78388.636	309932.208	95	33	3954.5775	14193.3933
86	43	61268.696	231543.572	96	34	2885.9318	10238.8158
87	44	46822.157	170274.876	97	35	2149.6382	7352.8840
88	45	34764.798	123452.719	98	36	1591.1453	5203.2458
89	46	25693.165	88687.921	99	37	1189.4168	3612.1005
90	47	19094.628	62994.756	100	38	925.57256	2422.68371
91	48	13377.960	43900.128	101	39	684.47210	1497.11115
92	49	9060.1231	30522.1678	102	40	464.52105	812.63905
93	50	6186.5658	21462.0447	103	41	264.50771	348.11800
94	51	4347.2599	15275.4789	104	42	83.61029	83.61029
95	52	3090.2363	10928.2190				
96	53	2243.4297	7837.9827				

Difference of Age 62 years.

COMMUTATION TABLES FOR JOINT ANNUITIES.

Difference of Age 44 years.

AGES.		D_{xy}	N_{xy}	AGES.		D_{xy}	N_{xy}
(x)	(y)			(x)	(y)		
44	0	8542663.8	89422653.9	98	54	1242.1547	4011.7836
45	1	6847105.6	80879990.1	99	55	922.58517	2769.62893
46	2	5963433.8	74032884.5	100	56	712.80136	1847.04376
47	3	5282381.5	68069450.7	101	57	522.94948	1134.24240
48	4	4815131.6	62787069.2	102	58	351.66302	611.29292
49	5	4434286.1	57971937.6	103	59	197.97153	259.62990
50	6	4130530.5	53537651.5	104	60	61.65837	61.65837
51	7	3870242.5	49407121.0	Difference of Age 61 years.			
52	8	3635934.8	45536878.5				
53	9	3420295.7	41900943.7	61	0	3218343.0	24025930.5
54	10	3219193.8	38480648.0	62	1	2524610.8	20807587.5
55	11	3029418.4	35261454.2	63	2	2148352.0	18282976.7
56	12	2846904.9	32232035.8	64	3	1857735.8	16134624.7
57	13	2671970.8	29385130.9	65	4	1650160.2	14276888.9
58	14	2502478.2	26713160.1	66	5	1477799.1	12626728.7
59	15	2335011.2	24210681.9	67	6	1336346.6	11148929.6
60	16	2168215.9	21875670.7	68	7	1212829.7	9812583.0
61	17	2001487.5	19707454.8	69	8	1102231.9	8599753.3
62	18	1842807.7	17705967.3	70	9	1001160.7	7497521.4
63	19	1693770.8	15863159.6	71	10	908298.23	6496360.75
64	20	1555349.3	14169388.8	72	11	818276.77	5588062.52
65	21	1425910.1	12614039.5	73	12	729666.24	4769785.75
66	22	1305603.0	11188129.4	74	13	643561.03	4040119.51
67	23	1193624.1	9882526.4	75	14	560094.07	3396558.48
68	24	1089045.3	8688902.3	76	15	484417.01	2836464.41
69	25	991435.38	7599857.04	77	16	415236.97	2352047.40
70	26	899857.38	6608421.66	78	17	353981.75	1936810.43
71	27	814515.73	5708564.28	79	18	301230.66	1582828.68
72	28	731372.25	4894048.55	80	19	253570.49	1281598.02
73	29	649630.97	4162676.30	81	20	212638.67	1028027.53
74	30	570190.22	3513045.33	82	21	175850.71	815388.86
75	31	493784.59	2942855.11	83	22	144289.22	639538.15
76	32	425056.70	2449070.52	84	23	116982.25	495248.93
77	33	362909.55	2024013.82	85	24	93955.286	378266.685
78	34	308332.39	1661104.27	86	25	73977.956	284311.399
79	35	261528.30	1352771.88	87	26	56951.669	210333.443
80	36	219419.31	1091243.58	88	27	42604.712	153381.774
81	37	183344.12	871824.27	89	28	31712.328	110777.062
82	38	151044.92	688480.15	90	29	23714.296	79064.734
83	39	123408.73	537435.23	91	30	16695.079	55350.438
84	40	99561.446	414026.496	92	31	11350.558	38655.359
85	41	79483.538	314465.050	93	32	7777.8794	27304.8013
86	42	62162.119	234981.512	94	33	5483.6805	19526.9219
87	43	47515.024	172819.393	95	34	3914.8293	14043.2414
88	44	35286.969	125304.369	96	35	2856.6303	10128.4121
89	45	26079.362	90017.400	97	36	2127.5886	7271.7818
90	46	19381.796	63938.038	98	37	1574.3554	5144.1932
91	47	13576.218	44556.242	99	38	1176.5056	3569.8378
92	48	9188.1598	30980.0236	100	39	915.23694	2393.33225
93	49	6272.3926	21791.8638	101	40	676.34266	1478.09531
94	50	4406.3858	15519.4712	102	41	458.47998	801.75265
95	51	3135.0433	11113.0854	103	42	260.86406	343.27267
96	52	2278.0588	7978.0421	104	43	82.40861	82.40861
97	53	1688.1997	5699.9833				

Difference of Age 61 years.

COMMUTATION TABLES FOR JOINT ANNUITIES.

Difference of Age 45 years.

AGES.		D_{xy}	N_{xy}	AGES.		D_{xy}	N_{xy}
(x)	(y)			(x)	(y)		
45	0	8092548.9	83764132.8	99	54	938.44104	2822.83252
46	1	6486259.6	75671583.9	100	55	725.80998	1884.39148
47	2	5649112.7	69185324.3	101	56	533.07796	1158.58150
48	3	5005039.6	63536211.6	102	57	359.16858	625.50354
49	4	4565416.2	58531172.0	103	58	202.88253	266.33496
50	5	4205394.8	53965755.8	104	59	63.45243	63.45243
51	6	3918371.1	49700361.0	Difference of Age 60 years.			
52	7	3668199.9	45841989.9				
53	8	3442946.7	42173790.0	60	0	3463050.4	26429298.3
54	9	3235638.6	38730843.3	61	1	2723040.0	22966247.9
55	10	3043079.2	35495204.7	62	2	2321114.2	20243207.9
56	11	2860694.6	32452125.5	63	3	2008884.5	17922093.7
57	12	2685397.8	29591430.9	64	4	1787247.1	15913209.2
58	13	2515514.0	26906033.1	65	5	1602763.5	14125962.1
59	14	2347983.5	24390519.1	66	6	1451491.4	12523198.6
60	15	2181721.7	22042535.6	67	7	1319932.5	11071707.2
61	16	2015004.5	19860813.9	68	8	1202161.8	9751774.7
62	17	1855638.2	17845809.4	69	9	1094980.4	8549612.9
63	18	1705646.2	15990171.2	70	10	996072.44	7454632.49
64	19	1566331.3	14284525.0	71	11	904220.72	6458560.05
65	20	1436049.7	12718193.7	72	12	814332.35	5554339.33
66	21	1314734.6	11282144.0	73	13	726017.90	4740006.98
67	22	1202031.4	9967409.4	74	14	640226.00	4013989.08
68	23	1096770.4	8765378.0	75	15	556999.63	3373763.08
69	24	998518.27	7668607.58	76	16	481418.24	2816763.45
70	25	906487.59	6670089.31	77	17	412451.48	2335345.21
71	26	820561.67	5763601.72	78	18	351534.22	1922893.73
72	27	737098.02	4943040.05	79	19	299133.36	1571359.51
73	28	655331.48	4205942.03	80	20	251792.65	1272226.15
74	29	575849.67	3550610.55	81	21	211137.28	1020433.50
75	30	498824.11	2974760.88	82	22	174629.33	809296.22
76	31	429439.52	2475936.77	83	23	143280.04	634666.89
77	32	366623.54	2046497.25	84	24	116158.29	491386.85
78	33	311462.96	1679873.71	85	25	93288.824	375228.562
79	34	264210.89	1368410.75	86	26	73436.869	281939.738
80	35	221693.30	1104199.86	87	27	56532.046	208502.869
81	36	185299.41	882506.56	88	28	42273.759	151970.823
82	37	152702.57	697207.15	89	29	31436.473	109697.064
83	38	124802.37	544504.64	90	30	23481.232	78260.591
84	39	100758.15	419702.27	91	31	16526.412	54779.359
85	40	80530.836	318944.119	92	32	11234.715	38252.947
86	41	63030.376	238413.283	93	33	7699.0876	27018.2318
87	42	48207.890	175382.907	94	34	5428.5630	19319.1442
88	43	35809.139	127175.017	95	35	3875.0812	13890.5812
89	44	26471.077	91365.878	96	36	2827.3288	10015.5000
90	45	19673.127	64894.801	97	37	2105.1381	7188.1712
91	46	13780.394	45221.674	98	38	1557.2656	5083.0331
92	47	9324.3258	31441.2803	99	39	1163.3679	3525.7675
93	48	6361.0334	22116.9545	100	40	904.36672	2362.39964
94	49	4467.5160	15755.9211	101	41	667.54688	1458.03292
95	50	3177.6822	11288.4051	102	42	452.16433	790.48604
96	51	2311.0896	8110.7229	103	43	257.11480	338.32171
97	52	1714.2583	5799.6333	104	44	81.20691	81.20691
98	53	1262.5425	4085.3750				

Difference of Age 60 years.

COMMUTATION TABLES FOR JOINT ANNUITIES.

Difference of Age 46 years.

AGES.		D_{xy}	N_{xy}	AGES.		D_{xy}	N_{xy}
(x)	(y)			(x)	(y)		
46	0	7666067.4	78396110.7	100	54	738.28400	1919.45473
47	1	6144381.3	70730043.3	101	55	542.80663	1181.17073
48	2	5352516.2	64585662.0	102	56	366.12496	638.36410
49	3	4745475.5	59233145.8	103	57	207.21267	272.23914
50	4	4329756.2	54487670.3	104	58	65.02647	65.02647
51	5	3989390.1	50157914.1	Difference of Age 59 years.			
52	6	3713815.9	46168524.0				
53	7	3473499.2	42454708.1	59	0	3706367.0	28989803.2
54	8	3257066.7	38981208.9	60	1	2930086.9	25283436.2
55	9	3058624.4	35724142.2	61	2	2503549.0	22353349.3
56	10	2873594.6	32665517.8	62	3	2170431.3	19849800.3
57	11	2698405.2	29791923.2	63	4	1932660.7	17679369.0
58	12	2528154.7	27093518.0	64	5	1735912.9	15746708.3
59	13	2360214.5	24565363.3	65	6	1574231.2	14010795.4
60	14	2193842.4	22205148.8	66	7	1433663.0	12436564.2
61	15	2027556.1	20011306.4	67	8	1308322.5	11002901.2
62	16	1868170.2	17983750.3	68	9	1194252.9	9694578.7
63	17	1717521.7	16115580.1	69	10	1089415.3	8500325.8
64	18	1577313.2	14398058.4	70	11	991600.9	7410910.5
65	19	1446189.3	12820745.2	71	12	899862.02	6419309.65
66	20	1324083.7	11374555.9	72	13	810260.70	5519447.63
67	21	1210438.6	10050472.2	73	14	722255.56	4709186.93
68	22	1104495.4	8840033.6	74	15	636688.84	3986931.37
69	23	1005601.2	7735538.2	75	16	553551.53	3350242.53
70	24	912963.61	6729937.05	76	17	478188.79	2796691.00
71	25	826607.62	5816973.44	77	18	409599.67	2318502.21
72	26	742569.31	4990365.82	78	19	349086.69	1908902.54
73	27	660461.96	4247796.51	79	20	297036.06	1559815.85
74	28	580902.76	3587334.56	80	21	250014.80	1262779.79
75	29	503775.22	3006431.80	81	22	209670.81	1012764.99
76	30	433822.34	2502656.58	82	23	173407.94	803094.18
77	31	370403.85	2068834.24	83	24	142270.85	629686.24
78	32	314650.45	1698430.39	84	25	115334.33	487415.39
79	33	266893.48	1383779.94	85	26	92606.494	372081.065
80	34	223967.28	1116886.46	86	27	72895.780	279474.571
81	35	187219.79	892919.18	87	28	56092.905	206578.791
82	36	154331.03	705699.39	88	29	41906.033	150485.886
83	37	126171.97	551368.36	89	30	31127.515	108579.853
84	38	101895.99	425196.39	90	31	23244.005	77452.338
85	39	81498.792	323300.405	91	32	16357.745	54208.333
86	40	63860.882	241801.613	92	33	11120.905	37850.588
87	41	48881.239	177940.731	93	34	7621.7028	26729.6827
88	42	36331.310	129059.492	94	35	5373.4458	19107.9799
89	43	26862.792	92728.182	95	36	3835.3331	13734.5341
90	44	19968.619	65865.390	96	37	2797.4946	9899.2010
91	45	13987.529	45896.771	97	38	2082.2866	7101.7064
92	46	9464.5567	31909.2418	98	39	1539.8761	5019.4198
93	47	6455.3023	22444.6851	99	40	1149.5506	3479.5437
94	48	4530.6505	15989.3828	100	41	892.6055	2329.9931
95	49	3221.7665	11458.7323	101	42	658.35128	1437.38764
96	50	2342.5221	8236.9658	102	43	445.66560	779.03636
97	51	1739.1143	5894.4437	103	44	253.36553	333.37076
98	52	1282.0308	4155.3294	104	45	80.00523	80.00523
99	53	953.84388	2873.29861				

Difference of Age 59 years.

COMMUTATION TABLES FOR JOINT ANNUITIES.

Difference of Age 47 years.

AGES.		D _{xy}	N _{xy}	AGES.		D _{xy}	N _{xy}
(x)	(y)			(x)	(y)		
47	0	7262003.7	73303814.3	101	54	552.13550	1202.58252
48	1	5821781.7	66041810.6	102	55	372.80674	650.44702
49	2	5074931.8	60220028.9	103	56	211.22596	277.64028
50	3	4500521.0	55145097.1	104	57	66.41432	66.41432
51	4	4107363.8	50644576.1	Difference of Age 58 years.			
52	5	3781127.5	46537212.3	58	0	3950241.8	31705273.9
53	6	3516694.0	42756084.8	59	1	3135957.1	27755032.1
54	7	3285969.7	39239390.8	60	2	2693906.9	24619075.0
55	8	3078880.2	35953421.1	61	3	2341022.7	21925168.1
56	9	2888274.0	32874540.9	62	4	2088077.8	19584145.4
57	10	2710573.4	29986266.9	63	5	1877149.8	17496067.6
58	11	2540400.5	27275693.5	64	6	1705010.2	15618917.8
59	12	2372074.9	24735293.0	65	7	1554895.2	13913907.6
60	13	2205270.5	22363218.1	66	8	1421052.7	12359012.4
61	14	2038820.3	20157947.6	67	9	1299715.2	10937959.7
62	15	1879807.1	18119127.3	68	10	1188183.2	9638244.5
63	16	1729121.0	16239320.2	69	11	1084524.7	8450061.3
64	17	1588295.2	14510199.2	70	12	986820.99	7365536.62
65	18	1456328.9	12921904.0	71	13	895362.71	6378715.63
66	19	1333432.7	11465575.1	72	14	806061.79	5483352.92
67	20	1219046.0	10132142.4	73	15	718265.20	4677291.13
68	21	1112220.4	8913096.4	74	16	632747.42	3959025.93
69	22	1012684.0	7800876.0	75	17	549838.20	3326278.51
70	23	919439.62	6788191.98	76	18	474882.45	2776440.31
71	24	832512.97	5868752.36	77	19	406747.86	2301557.86
72	25	748040.60	5036239.39	78	20	346639.15	1894810.00
73	26	665364.40	4288198.79	79	21	294938.76	1548170.85
74	27	585450.54	3622834.39	80	22	248278.30	1253232.09
75	28	508195.85	3037383.85	81	23	208204.33	1004953.79
76	29	438128.27	2529188.00	82	24	172186.55	796749.46
77	30	374184.15	2091059.73	83	25	141261.67	624562.91
78	31	317894.85	1716875.58	84	26	114490.76	483301.24
79	32	269624.85	1398980.73	85	27	91924.163	368810.484
80	33	226241.27	1129355.88	86	28	72329.526	276886.321
81	34	189140.18	903114.61	87	29	55604.971	204556.795
82	35	155930.47	713974.43	88	30	41494.180	148951.824
83	36	127517.55	558043.96	89	31	30813.040	107457.644
84	37	103014.22	430526.41	90	32	23006.779	76644.604
85	38	82419.145	327512.193	91	33	16192.037	53637.825
86	39	64628.471	245093.048	92	34	11009.127	37445.788
87	40	49525.312	180464.577	93	35	7544.3179	26436.6606
88	41	36838.772	130939.265	94	36	5318.3283	18892.3427
89	42	27254.506	94100.493	95	37	3794.8622	13574.0144
90	43	20264.111	66845.987	96	38	2767.1275	9779.1522
91	44	14197.623	46581.876	97	39	2059.0343	7012.0247
92	45	9606.8197	32384.2530	98	40	1521.5871	4952.9904
93	46	6552.3850	22777.4333	99	41	1134.6008	3431.4033
94	47	4597.7936	16225.0483	100	42	880.30968	2296.80248
95	48	3267.2962	11627.2547	101	43	648.88915	1416.49280
96	49	2375.0201	8359.9585	102	44	439.16689	767.60365
97	50	1762.7675	5984.9384	103	45	249.61628	328.43676
98	51	1300.6196	4222.1709	104	46	78.82048	78.82048
99	52	968.56719	2921.55134				
100	53	750.40163	1952.98415				

Difference of Age 58 years.

COMMUTATION TABLES FOR JOINT ANNUITIES.

Difference of Age 48 years.

AGES.		D _{x,y}	N _{x,y}	AGES.		D _{x,y}	N _{x,y}
(x)	(y)			(x)	(y)		
48	0	6880725.3	68473390.1	102	54	379.21392	661.99539
49	1	5519860.9	61592664.8	103	55	215.08083	282.78147
50	2	4812971.3	56072803.9	104	56	67.70064	67.70064
51	3	4269357.6	51259832.6	Difference of Age 57 years.			
52	4	3892942.5	46990475.0	57	0	4195934.1	34575348.7
53	5	3580432.8	43097532.5	58	1	3342299.6	30379414.6
54	6	3326832.5	39517099.7	59	2	2883182.9	27037115.0
55	7	3106201.9	36190267.2	60	3	2519022.9	24153932.1
56	8	2907401.6	33084065.3	61	4	2252196.4	21634909.2
57	9	2724420.0	30176663.7	62	5	2028103.0	19382712.8
58	10	2551856.2	27452243.7	63	6	1843732.9	17354609.8
59	11	2383564.6	24900387.5	64	7	1684067.9	15510876.9
60	12	2216352.3	22516822.9	65	8	1541218.5	13826809.0
61	13	2049440.8	20300470.6	66	9	1411703.6	12285590.5
62	14	1890250.5	18251029.8	67	10	1293109.5	10873886.9
63	15	1739891.7	16360779.3	68	11	1182849.3	9580777.4
64	16	1599021.7	14620887.6	69	12	1079296.9	8397928.1
65	17	1466468.5	13021865.9	70	13	981886.89	7318631.22
66	18	1342781.7	11555397.4	71	14	890722.79	6336744.33
67	19	1227653.3	10212615.7	72	15	801608.41	5446021.54
68	20	1120129.4	8984962.4	73	16	713818.80	4644413.13
69	21	1019766.9	7864833.0	74	17	628502.84	3930594.33
70	22	925915.63	6845066.08	75	18	546036.46	3302091.49
71	23	838418.32	5919150.45	76	19	471576.12	2756055.03
72	24	753384.67	5080732.13	77	20	403896.05	2284478.91
73	25	670266.84	4327347.46	78	21	344191.62	1880582.86
74	26	589796.20	3657080.62	79	22	292890.24	1536391.24
75	27	512174.42	3067284.42	80	23	246541.80	1243501.00
76	28	441972.85	2555110.00	81	24	206737.86	996959.20
77	29	377898.14	2113137.15	82	25	170965.16	790221.34
78	30	321139.26	1735239.01	83	26	140228.46	619256.18
79	31	272404.99	1414099.75	84	27	113647.18	479027.72
80	32	228556.61	1141694.76	85	28	91210.097	365380.540
81	33	191060.56	913138.15	86	29	71700.355	274170.443
82	34	157529.90	722077.59	87	30	55058.485	202470.088
83	35	128839.10	564547.69	88	31	41074.973	147411.603
84	36	104112.83	435708.59	89	32	30498.565	106336.630
85	37	83323.629	331595.758	90	33	22773.715	75838.065
86	38	65358.309	248272.129	91	34	16029.288	53064.350
87	39	50120.592	182913.820	92	35	10897.349	37035.062
88	40	37324.170	132793.228	93	36	7466.9331	26137.7131
89	41	27635.186	95469.058	94	37	5262.2087	18670.7800
90	42	20559.604	67833.872	95	38	3753.6687	13408.5713
91	43	14407.717	47274.268	96	39	2736.2278	9654.9026
92	44	9751.115	32866.551	97	40	2034.5793	6918.6748
93	45	6650.8748	23115.4362	98	41	1501.7989	4884.0955
94	46	4666.9408	16464.5614	99	42	1118.9715	3382.2966
95	47	3315.7166	11797.6206	100	43	867.65745	2263.32508
96	48	2408.5837	8481.9040	101	44	639.42701	1395.66763
97	49	1787.2225	6073.3203	102	45	432.66817	756.24062
98	50	1318.3090	4286.0978	103	46	245.91982	323.57245
99	51	982.61096	2967.78882	104	47	77.65263	77.65263
100	52	761.98465	1985.17786				
101	53	561.19782	1223.19321				

Difference of Age 57 years.

COMMUTATION TABLES FOR JOINT ANNUITIES.

Difference of Age 49 years.

AGES.		D _{xy}	N _{xy}	AGES.		D _{xy}	N _{xy}
(x)	(y)			(x)	(y)		
49	0	6523887.1	63890238.6	103	54	218.77729	287.71347
50	1	5234933.8	57366351.5	104	55	68.93618	68.93618
51	2	4565759.3	52131417.7	Difference of Age 56 years.			
52	3	4046479.5	47565658.4	56	0	4448288.9	37604788.3
53	4	3686312.9	43519178.9	57	1	3550179.8	33156499.4
54	5	3387130.1	39832866.0	58	2	3072893.1	29606319.6
55	6	3144829.3	36445735.9	59	3	2696011.4	26533426.5
56	7	2933201.7	33300906.6	60	4	2423442.7	23837415.1
57	8	2742462.5	30367704.9	61	5	2187507.7	21413972.4
58	9	2564892.0	27625242.4	62	6	1991998.8	19226464.7
59	10	2394313.1	25060350.4	63	7	1821086.7	17234465.9
60	11	2227087.7	22666037.3	64	8	1669255.0	15413379.2
61	12	2059739.5	20438949.6	65	9	1531078.9	13744124.2
62	13	1900097.1	18379210.1	66	10	1404528.8	12213045.3
63	14	1749557.8	16479113.0	67	11	1287304.5	10808516.5
64	15	1608982.1	14729555.2	68	12	1177147.5	9521212.0
65	16	1476372.3	13120573.1	69	13	1073900.4	8344064.5
66	17	1352130.7	11644200.8	70	14	976798.58	7270164.08
67	18	1236260.7	10292070.1	71	15	885801.67	6293365.50
68	19	1128038.3	9055809.4	72	16	796646.08	5407563.83
69	20	1027018.4	7927771.1	73	17	709030.36	4610917.75
70	21	932391.65	6900752.68	74	18	624157.18	3901887.39
71	22	844323.66	5968361.03	75	19	542234.71	3277730.21
72	23	758728.73	5124037.37	76	20	468269.78	2735495.50
73	24	675055.28	4365308.64	77	21	401044.24	2267225.72
74	25	594141.86	3690253.36	78	22	341801.00	1866181.48
75	26	515976.16	3096111.50	79	23	290841.71	1524380.48
76	27	445432.97	2580135.34	80	24	244805.30	1233538.77
77	28	381214.20	2134702.37	81	25	205271.39	988733.47
78	29	324326.75	1753488.17	82	26	169714.70	783462.08
79	30	275185.13	1429161.42	83	27	139195.25	613747.38
80	31	230913.29	1153976.29	84	28	112764.37	474552.13
81	32	193015.86	923063.00	85	29	90416.69	361787.76
82	33	159129.34	730047.14	86	30	70995.684	271371.073
83	34	130160.65	570917.80	87	31	54502.240	200375.389
84	35	105191.82	440757.15	88	32	40655.765	145873.149
85	36	84212.245	335565.327	89	33	30189.607	105217.384
86	37	66075.564	251353.082	90	34	22544.812	75027.777
87	38	50686.595	185277.518	91	35	15866.539	52482.965
88	39	37772.795	134590.923	92	36	10785.570	36616.426
89	40	27999.315	96818.128	93	37	7388.1412	25830.8565
90	41	20846.772	68818.813	94	38	5205.0871	18442.7153
91	42	14617.811	47972.041	95	39	3711.7525	13237.6282
92	43	9895.4104	33354.2304	96	40	2703.7297	9525.8757
93	44	6750.7716	23458.8200	97	41	2008.1197	6822.1460
94	45	4737.0902	16708.0484	98	42	1481.1113	4814.0263
95	46	3365.5825	11970.9582	99	43	1102.8891	3332.9150
96	47	2444.2782	8605.3757	100	44	855.00523	2230.02591
97	48	1812.4794	6161.0975	101	45	629.96488	1375.02068
98	49	1336.5980	4348.6181	102	46	426.26098	745.05580
99	50	995.9752	3012.0201	103	47	242.27617	318.79482
100	51	773.03307	2016.04493	104	48	76.51865	76.51865
101	52	569.86034	1243.01186				
102	53	385.43805	673.15152				

Difference of Age 56 years..

COMMUTATION TABLES FOR JOINT ANNUITIES.

Difference of Age 50 years.

AGES.		$D_{x,y}$	$N_{x,y}$	AGES.		$D_{x,y}$	$N_{x,y}$
(x)	(y)			(x)	(y)		
50	0	6187133.7	59536890.6	104	54	70.12095	70.12095
51	1	4966048.2	53349756.9	Difference of Age 55 years.			
52	2	4327407.8	48383708.7	55	0	4710649.0	40801086.4
53	3	3831700.5	44056300.9	56	1	3763697.2	36090437.4
54	4	3487293.9	40224600.4	57	2	3264017.1	32326740.2
55	5	3201828.1	36737306.5	58	3	2873405.9	29062723.1
56	6	2969677.7	33535478.4	59	4	2593715.6	26189317.2
57	7	2766798.9	30565800.7	60	5	2353835.4	23595601.6
58	8	2581878.0	27799001.8	61	6	2148565.8	21241766.2
59	9	2406544.1	25217123.8	62	7	1967531.4	19093200.4
60	10	2237130.6	22810579.7	63	8	1805068.6	17125669.0
61	11	2069716.4	20573449.1	64	9	1658273.1	15320600.4
62	12	1909645.3	18503732.7	65	10	1523297.4	13662327.3
63	13	1758671.5	16594087.4	66	11	1398223.6	12139029.9
64	14	1617920.9	14835415.9	67	12	1281099.2	10740806.3
65	15	1485568.7	13217495.0	68	13	1171261.7	9459707.1
66	16	1361262.4	11731926.3	69	14	1068335.3	8288445.4
67	17	1244868.1	10370663.9	70	15	971401.91	7220110.10
68	18	1135947.3	9125795.8	71	16	880318.14	6248708.19
69	19	1034270.0	7989848.5	72	17	791302.01	5368390.05
70	20	939021.85	6955578.48	73	18	704127.91	4577088.04
71	21	850229.00	6016556.63	74	19	619811.53	3872960.13
72	22	764072.78	5166327.63	75	20	538432.97	3253148.60
73	23	679843.71	4402254.85	76	21	464963.44	2714715.63
74	24	598386.44	3722411.14	77	22	398258.75	2249752.19
75	25	519777.90	3124024.70	78	23	339410.39	1851493.44
76	26	448739.31	2604246.80	79	24	288793.19	1512083.05
77	27	384198.65	2155507.49	80	25	243068.79	1223289.86
78	28	327172.72	1771308.84	81	26	203770.00	980221.07
79	29	277916.50	1444136.12	82	27	168464.23	776451.07
80	30	233269.97	1166219.62	83	28	138113.98	607986.84
81	31	195006.07	932949.65	84	29	111783.47	469872.86
82	32	160757.85	737943.58	85	30	89528.074	358089.391
83	33	131482.20	577185.73	86	31	70278.428	268561.317
84	34	106270.81	445703.53	87	32	53945.995	198282.889
85	35	85084.993	339432.718	88	33	40243.913	144336.894
86	36	66780.236	254347.725	89	34	29886.166	104092.981
87	37	51242.840	187567.489	90	35	22315.910	74206.815
88	38	38199.357	136324.649	91	36	15703.790	51890.905
89	39	28335.859	98125.292	92	37	10671.760	36187.115
90	40	21121.455	69789.433	93	38	7307.9424	25515.3549
91	41	14821.987	48667.978	94	39	5146.9633	18207.4125
92	42	10039.706	33845.991	95	40	3667.6682	13060.4492
93	43	6850.6684	23806.2851	96	41	2668.5679	9392.7810
94	44	4808.2418	16955.6167	97	42	1980.4575	6724.2131
95	45	3416.1710	12147.3749	98	43	1459.8241	4743.7556
96	46	2481.0383	8731.2039	99	44	1086.8067	3283.9315
97	47	1839.3398	6250.1656	100	45	842.35301	2197.12485
98	48	1355.4867	4410.8258	101	46	620.63601	1354.77184
99	49	1009.7925	3055.3391	102	47	419.94533	734.13583
100	50	783.54689	2045.54661	103	48	238.73814	314.19050
101	51	578.12305	1261.99972	104	49	75.45236	75.45236
102	52	391.38759	683.87667				
103	53	222.36813	292.48908				

Difference of Age 55 years.

COMMUTATION TABLES FOR JOINT ANNUITIES.

Difference of Age 51 years.

AGES.		D _{x,y}	N _{x,y}	AGES.		D _{x,y}	N _{x,y}
(x)	(y)			(x)	(y)		
51	0	5869339.6	55399439.5	Difference of Age 54 years.			
52	1	4706800.0	49530099.9	54	0	4983272.2	44171244.7
53	2	4097717.6	44823299.9	55	1	3985680.1	39187972.5
54	3	3624832.2	40725582.3	56	2	3460323.9	35202292.4
55	4	3296512.2	37100750.1	57	3	3052122.5	31741968.5
56	5	3023502.0	33804237.9	58	4	2764379.2	28689846.0
57	6	2801205.6	30780735.9	59	5	2519217.6	25925466.8
58	7	2604789.4	27979530.3	60	6	2311932.4	23406249.2
59	8	2422481.5	25374740.9	61	7	2122175.4	21094316.8
60	9	2243558.6	22952259.4	62	8	1950225.3	18972141.4
61	10	2079049.6	20703700.8	63	9	1793193.2	17021916.1
62	11	1918895.1	18624651.2	64	10	1649845.1	15228722.9
63	12	1767509.1	16705756.1	65	11	1516459.1	13578877.8
64	13	1626348.9	14938247.0	66	12	1391483.6	12062418.7
65	14	1493821.8	13311898.1	67	13	1274693.7	10670935.1
66	15	1369741.7	11818076.3	68	14	1165192.1	9396241.4
67	16	1253275.3	10448334.6	69	15	1062432.9	8231049.3
68	17	1143856.2	9195059.3	70	16	965388.48	7168616.41
69	18	1041521.5	8051203.1	71	17	874412.79	6203227.93
70	19	945652.05	7009681.62	72	18	785830.72	5328815.14
71	20	856274.95	6064029.57	73	19	699225.47	4542984.42
72	21	769416.84	5207754.62	74	20	615465.87	3843758.95
73	22	684632.15	4438337.78	75	21	534631.23	3228293.08
74	23	602631.04	3753705.63	76	22	461733.99	2693661.85
75	24	523491.24	3151074.59	77	23	395473.26	2231927.86
76	25	452045.65	2627583.35	78	24	337019.77	1836454.60
77	26	387050.46	2175537.70	79	25	286744.66	1499434.83
78	27	329734.09	1788487.24	80	26	241290.95	1212690.17
79	28	280355.22	1458753.15	81	27	202268.61	971399.22
80	29	235585.30	1178397.93	82	28	167155.60	769130.61
81	30	196996.29	942812.63	83	29	136912.57	601975.01
82	31	162415.45	745816.34	84	30	110684.86	465062.44
83	32	132827.78	583400.89	85	31	88623.59	354377.58
84	33	107349.80	450573.11	86	32	69561.172	265753.992
85	34	85957.741	343223.306	87	33	53399.509	196192.820
86	35	67472.324	257265.565	88	34	39839.414	142793.311
87	36	51789.326	189793.241	89	35	29582.725	102953.897
88	37	38618.564	138003.915	90	36	22087.007	73371.172
89	38	28655.851	99385.351	91	37	15538.082	51284.165
90	39	21375.329	70729.500	92	38	10555.917	35746.083
91	40	15017.286	49354.171	93	39	7226.3366	25190.1661
92	41	10179.936	34336.885	94	40	5085.8331	17963.8295
93	42	6950.5652	24156.9494	95	41	3619.9705	12877.9964
94	43	4879.3934	17206.3842	96	42	2631.8079	9258.0259
95	44	3467.4822	12326.9908	97	43	1951.9934	6626.2180
96	45	2518.3311	8859.5086	98	44	1438.5369	4674.2246
97	46	1867.0021	6341.1775	99	45	1070.7243	3235.6877
98	47	1375.5747	4474.1754	100	46	829.87898	2164.96339
99	48	1024.0627	3098.6007	101	47	611.44042	1335.08441
100	49	794.41712	2074.53799	102	48	413.81273	723.64399
101	50	585.98595	1230.12087	103	49	235.41133	309.83126
102	51	397.06252	694.13492	104	50	74.41993	74.41993
103	52	225.80055	297.07240				
104	53	71.27185	71.27185				

Difference of Age 54 years.

COMMUTATION TABLES FOR JOINT ANNUITIES.

Difference of Age 52 years.

AGES.		D_{xy}	N_{xy}	AGES.		D_{xy}	N_{xy}
(x)	(y)			(x)	(y)		
Difference of Age 53 years.							
52	0	5562935.8	51463803.3	53	0	5267666.3	47723289.9
53	1	4456972.5	45900867.5	54	1	4216346.6	42455623.6
54	2	3876487.4	41443895.0	55	2	3664413.8	38239277.0
55	3	3426526.1	37567407.6	56	3	3235685.3	34574863.2
56	4	3112912.6	34140881.5	57	4	2936314.7	31339177.9
57	5	2851976.4	31027968.9	58	5	2684979.4	28402863.2
58	6	2637181.4	28175992.5	59	6	2474370.6	25717883.8
59	7	2443978.4	25538811.1	60	7	2283535.4	23243513.2
60	8	2263449.7	23094832.7	61	8	2103509.0	20959977.8
61	9	2089670.1	20831383.0	62	9	1937394.8	18856468.8
62	10	1927548.2	18741712.9	63	10	1784079.5	16919074.0
63	11	1776070.4	16814164.7	64	11	1642438.7	15134994.5
64	12	1634521.5	15038094.3	65	12	1509149.1	13492555.8
65	13	1501603.4	13403572.8	66	13	1384526.2	11983406.7
66	14	1377351.4	11901969.4	67	14	1268088.0	10598880.5
67	15	1261082.0	10524618.0	68	15	1158754.5	9330792.5
68	16	1151581.3	9263536.0	69	16	1055855.9	8172038.0
69	17	1048773.0	8111954.7	70	17	958912.47	7116182.08
70	18	952282.25	7063181.74	71	18	868366.84	6157269.61
71	19	862320.89	6110899.49	72	19	780359.42	5288902.77
72	20	774888.13	5248578.60	73	20	694323.03	4508543.35
73	21	689420.58	4473690.47	74	21	611120.22	3814220.32
74	22	606875.63	3784269.89	75	22	530917.90	3203100.10
75	23	527204.57	3177394.26	76	23	458504.54	2672182.20
76	24	455275.10	2650189.69	77	24	392687.77	2213677.66
77	25	389902.28	2194914.59	78	25	334629.16	1820989.89
78	26	332181.62	1805012.31	79	26	284647.36	1486360.73
79	27	282550.06	1472830.69	80	27	239513.10	1201713.37
80	28	237652.56	1190280.63	81	28	200697.39	962200.27
81	29	198951.58	952628.07	82	29	165701.57	761502.88
82	30	164073.05	753676.49	83	30	135566.99	595801.31
83	31	134197.38	589603.44	84	31	109566.64	460234.32
84	32	108448.41	455406.06	85	32	87719.105	350667.677
85	33	86830.489	346957.653	86	33	68856.502	262948.572
86	34	68164.413	260127.164	87	34	52862.781	194092.070
87	35	52326.054	191962.751	88	35	39434.916	141229.289
88	36	39030.417	139636.697	89	36	29279.284	101794.373
89	37	28970.326	100606.280	90	37	21853.943	72515.089
90	38	21616.717	71635.954	91	38	15369.415	50661.146
91	39	15197.789	50019.237	92	39	10438.042	35291.731
92	40	10314.070	34821.448	93	40	7140.5098	24853.6886
93	41	7047.648	24507.378	94	41	5019.6922	17713.1788
94	42	4950.5449	17459.7302	95	42	3570.1046	12693.4866
95	43	3518.7934	12509.1853	96	43	2593.9823	9123.3820
96	44	2556.1567	8990.3919	97	44	1923.5293	6529.3997
97	45	1895.0653	6434.2352	98	45	1417.2497	4605.8704
98	46	1396.2623	4539.1699	99	46	1054.8684	3188.6207
99	47	1039.2391	3142.9076	100	47	817.58316	2133.75227
100	48	805.64374	2103.66852	101	48	602.51136	1316.16911
101	49	594.11539	1298.02478	102	49	408.04627	713.65775
102	50	402.46286	703.90939	103	50	232.19014	305.61148
103	51	229.07455	301.44653	104	51	73.42134	73.42134
104	52	72.37198	72.37198				

Difference of Age 53 years.

COMMUTATION TABLES

FOR

JOINT ANNUITIES.

TABLE XXXVIII.

CARLISLE MORTALITY, FIVE PER CENT.

CARLISLE 5 PER CENT.
COMMUTATION TABLES FOR JOINT ANNUITIES.

Equal Ages.

AGES.		D _{x,y}	N _{x,y}	AGES.		D _{x,y}	N _{x,y}
(x)	(y)			(x)	(y)		
0	0	100000000.	870350972.	54	54	1231424.3	11319373.9
1	1	68179543.	770350972.	55	55	1133489.1	10087949.6
2	2	54886930.	702171429.	56	56	1041164.2	8954460.5
3	3	45706577.	647284499.	57	57	954262.68	7913296.34
4	4	40289389.	601577922.	58	58	871235.12	6959033.66
5	5	36198289.	561288533.	59	59	790063.93	6087798.54
6	6	33258056.	525090244.	60	60	710493.97	5297734.61
7	7	30901018.	491832188.	61	61	632098.54	4587240.64
8	8	28914101.	460931170.	62	62	559684.16	3955142.10
9	9	27176099.	432017069.	63	63	493899.12	3395457.94
10	10	25619582.	404840970.	64	64	435084.52	2901558.82
11	11	24181026.	379221388.	65	65	382062.17	2466474.30
12	12	22808061.	355040362.	66	66	334582.57	2084412.13
13	13	21505286.	332232301.	67	67	292139.33	1749829.56
14	14	20269501.	310727015.	68	68	254075.99	1457690.23
15	15	19091568.	290457514.	69	69	220019.48	1203614.24
16	16	17958027.	271365946.	70	70	189466.92	983594.76
17	17	16874194.	253407919.	71	71	162287.78	794127.84
18	18	15849195.	236533725.	72	72	136903.58	631840.06
19	19	14885014.	220684530.	73	73	113223.69	494936.48
20	20	13978114.	205799516.	74	74	91643.031	381712.791
21	21	13125162.	191821402.	75	75	72249.059	290069.760
22	22	12327115.	178696240.	76	76	56290.943	217820.701
23	23	11576459.	166369125.	77	77	43138.284	161529.758
24	24	10870435.	154792666.	78	78	32730.772	118391.474
25	25	10206444.	143922231.	79	79	24756.928	85660.702
26	26	9578748.7	133715787.1	80	80	18324.910	60903.774
27	27	8988681.2	124137038.4	81	81	13462.251	42578.864
28	28	8428167.0	115148357.2	82	82	9619.5211	29116.6129
29	29	7887787.6	106720190.2	83	83	6764.9446	19497.0918
30	30	7365245.2	98832402.6	84	84	4645.2621	12732.1472
31	31	6873502.4	91467157.4	85	85	3130.6146	8086.8851
32	32	6413255.0	84593655.0	86	86	2027.9274	4956.2705
33	33	5984740.1	78180400.0	87	87	1256.3609	2928.3431
34	34	5585749.9	72195659.9	88	88	735.05126	1671.98219
35	35	5212285.0	66609910.0	89	89	426.09802	936.93093
36	36	4862766.4	61397625.0	90	90	249.76969	510.83291
37	37	4533983.8	56534858.6	91	91	130.06258	261.06322
38	38	4224842.5	52000874.8	92	92	63.19853	131.00064
39	39	3934299.0	47776032.3	93	93	31.20202	67.80212
40	40	3658475.3	43841733.3	94	94	16.30519	36.60010
41	41	3394226.3	40183258.0	95	95	8.73492	20.29491
42	42	3144150.6	36789031.7	96	96	4.88971	11.55999
43	43	2908973.0	33644881.1	97	97	2.85222	6.67028
44	44	2690241.9	30735908.1	98	98	1.64325	3.81806
45	45	2486868.1	28045666.2	99	99	.96615	2.17481
46	46	2298818.7	25558798.1	100	100	.61596	1.20865
47	47	2124955.1	23259979.4	101	101	.35488	.59269
48	48	1965090.9	21135024.3	102	102	.17244	.23782
49	49	1819719.6	19169933.4	103	103	.05912	.06538
50	50	1685962.8	17350213.8	104	104	.00626	.00626
51	51	1562877.2	15664251.0				
52	52	1446211.6	14101373.8				
53	53	1335788.3	12655162.2				

Equal Ages.

COMMUTATION TABLES FOR JOINT ANNUITIES.

Difference of Age 1 year.

AGES.		D_{xy}	N_{xy}	AGES.		D_{xy}	N_{xy}
(x)	(y)			(x)	(y)		
1	0	80580952.	798102435.	55	54	1152969.7	10426401.2
2	1	59698974.	717521483.	56	55	1060165.5	9273431.5
3	2	48879772.	657822509.	57	56	972744.84	8213265.99
4	3	41878396.	608942737.	58	57	889829.94	7240521.15
5	4	37268740.	567064341.	59	58	809662.74	6350691.21
6	5	33860846.	529795601.	60	59	731167.14	5541028.47
7	6	31285289.	495934755.	61	60	654000.29	4809861.33
8	7	29170683.	464649466.	62	61	580455.94	4155861.04
9	8	27356073.	435478783.	63	62	513092.87	3575405.10
10	9	25750456.	408122710.	64	63	452388.23	3062312.23
11	10	24290068.	382372254.	65	64	397886.48	2609924.00
12	11	22918537.	358082186.	66	65	348918.52	2212037.52
13	12	21613353.	335163649.	67	66	305106.90	1863119.00
14	13	20375088.	313550296.	68	67	265877.86	1558012.10
15	14	19197633.	293175208.	69	68	230737.26	1292134.24
16	15	18069888.	273977575.	70	69	199251.96	1061396.98
17	16	16988153.	255907687.	71	70	171125.59	862145.02
18	17	15959544.	238919534.	72	71	145464.05	691019.43
19	18	14989377.	222959990.	73	72	121501.43	545555.38
20	19	14076811.	207970613.	74	73	99408.546	424053.947
21	20	13218494.	193893802.	75	74	79409.264	324645.401
22	21	12413333.	180675308.	76	75	62235.862	245236.137
23	22	11657997.	168261975.	77	76	48090.140	183000.275
24	23	10947544.	156603978.	78	77	36670.337	134910.135
25	24	10279359.	145656434.	79	78	27779.976	98239.798
26	25	9649325.6	135377075.1	80	79	20786.179	70459.822
27	26	9055402.0	125727749.5	81	80	15327.987	49673.643
28	27	8494149.5	116672347.5	82	81	11105.571	34345.656
29	28	7957003.0	108178198.0	83	82	7872.5278	23240.0855
30	29	7438349.3	100221195.0	84	83	5470.6962	15367.5577
31	30	6943652.8	92782845.7	85	84	3721.5621	9896.8615
32	31	6479383.0	85839192.9	86	85	2458.9311	6175.2994
33	32	6045987.3	79359809.9	87	86	1557.7177	3716.3683
34	33	5642463.2	73313822.6	88	87	937.82403	2158.65064
35	34	5265749.3	67671359.4	89	88	546.15879	1220.82661
36	35	4913162.5	62405610.1	90	89	318.36841	674.66782
37	36	4582337.1	57492447.6	91	90	175.89415	356.29941
38	37	4271206.8	52910110.5	92	91	88.47794	180.40526
39	38	3978728.4	48638903.7	93	92	43.33613	91.92732
40	39	3702449.1	44660175.3	94	93	22.01201	48.59118
41	40	3438949.6	40957726.2	95	94	11.64656	26.57918
42	41	3188066.9	37518776.6	96	95	6.37788	14.93262
43	42	2951391.8	34330709.7	97	96	3.64450	8.55474
44	43	2730051.6	31379317.9	98	97	2.11276	4.91023
45	44	2524221.1	28649266.3	99	98	1.22965	2.79748
46	45	2333372.6	26125045.2	100	99	.75284	1.56783
47	46	2156912.8	23791672.6	101	100	.45627	.81499
48	47	1994213.1	21634759.8	102	101	.24141	.35872
49	48	1845435.7	19640546.7	103	102	.09854	.11730
50	49	1709352.3	17795111.0	104	103	.01877	.01877
51	50	1584133.4	16085758.7	Difference of Age 104 years.			
52	51	1467181.0	14501625.3				
53	52	1356407.2	13034444.3				
54	53	1251635.9	11678037.1	104	0	62.56230	-62.56230

Difference of Age 104 years.

COMMUTATION TABLES FOR JOINT ANNUITIES.

Difference of Age 2 years.

AGES.		D _{x,y}	N _{x,y}	AGES.		D _{x,y}	N _{x,y}
(x)	(y)			(x)	(y)		
2	0	70557823.	742473862.	56	54	1078385.9	9580833.7
3	1	53165156.	671916039.	57	55	990497.43	8502447.81
4	2	44785818.	618750883.	58	56	907064.16	7511950.38
5	3	38738613.	573965065.	59	57	826943.41	6604886.22
6	4	34862175.	535226452.	60	58	749304.92	5777942.81
7	5	31852324.	500364277.	61	59	673029.66	5028637.89
8	6	29533436.	468511953.	62	60	600568.30	4355608.23
9	7	27598829.	438978517.	63	61	532135.49	3755039.93
10	8	25920989.	411379688.	64	62	469968.80	3222904.44
11	9	24414151.	385458699.	65	63	413710.80	2752935.64
12	10	23021886.	361044548.	66	64	363370.09	2339224.84
13	11	21718043.	338022662.	67	65	318179.89	1975854.75
14	12	20477475.	316304619.	68	66	277679.73	1657674.86
15	13	19297636.	295827144.	69	67	241455.04	1379995.13
16	14	18170276.	276529508.	70	68	208958.10	1138540.09
17	15	17093973.	258359232.	71	69	179963.40	929581.99
18	16	16067326.	241265259.	72	70	153385.67	749618.59
19	17	15093739.	225197933.	73	71	129098.82	596232.92
20	18	14175507.	210104194.	74	72	106676.27	467134.10
21	19	13311827.	195928687.	75	73	86138.13	360457.83
22	20	12501604.	182616860.	76	74	68403.714	274319.698
23	21	11739535.	170115256.	77	75	53168.967	205915.984
24	22	11024652.	158375721.	78	76	40879.736	152747.017
25	23	10352275.	147351069.	79	77	31123.650	111867.281
26	24	9718261.	136998794.	80	78	23324.361	80743.631
27	25	9122122.7	127280533.0	81	79	17386.731	57419.270
28	26	8557199.6	118158410.3	82	80	12644.695	40032.539
29	27	8019296.8	109601210.7	83	81	9088.6976	27387.8437
30	28	7503620.9	101581913.9	84	82	6366.3800	18299.1461
31	29	7012572.5	94078293.0	85	83	4382.8605	11932.7661
32	30	6545511.0	87065720.5	86	84	2923.0888	7549.9056
33	31	6108328.4	80520209.5	87	85	1888.7858	4626.8168
34	32	5700207.6	74411881.1	88	86	1162.7750	2738.0310
35	33	5319213.6	68711673.5	89	87	696.82328	1575.25596
36	34	4963558.6	63392459.9	90	88	408.07442	878.43268
37	35	4629826.9	58428901.3	91	89	224.20311	470.35826
38	36	4316757.6	53799074.4	92	90	119.65588	246.15515
39	37	4022391.8	49482316.8	93	91	60.67059	126.49927
40	38	3744260.3	45459925.0	94	92	30.57223	65.82868
41	39	3480284.8	41715664.7	95	93	15.72286	35.25645
42	40	3230073.7	38235379.9	96	94	8.50384	19.53359
43	41	2992615.7	35005306.2	97	95	4.75370	11.02975
44	42	2769861.4	32012690.5	98	96	2.69963	6.27605
45	43	2561574.1	29242829.1	99	97	1.58097	3.57642
46	44	2368420.0	26681255.0	100	98	.95817	1.99545
47	45	2189333.6	24312835.0	101	99	.55766	1.03728
48	46	2024204.5	22123501.4	102	100	.31039	.47962
49	47	1872784.5	20099296.9	103	101	.13795	.16923
50	48	1733508.7	18226512.4	104	102	.03128	.03128
51	49	1606110.3	16493003.7	Difference of Age 103 years.			
52	50	1487135.7	14886893.4				
53	51	1376074.5	13399757.7				
54	52	1270955.9	12023683.2	103	0	197.07130	250.00526
55	53	1171893.6	10752727.3	104	1	52.93396	52.93396

Difference of Age 103 years.

COMMUTATION TABLES FOR JOINT ANNUITIES.

Difference of Age 3 years.

AGES.		D_{xy}	N_{xy}	AGES.		D_{xy}	N_{xy}
(x)	(y)			(x)	(y)		
3	0	62835547.	694691162.	57	54	1007520.5	8780889.7
4	1	48712278.	631855615.	58	55	923618.08	7773369.17
5	2	41428055.	583143337.	59	56	842959.64	6849751.09
6	3	36237133.	541715282.	60	57	765297.37	6006791.45
7	4	32794256.	505478149.	61	58	689725.25	5241494.08
8	5	30068719.	472683893.	62	59	618042.97	4551768.83
9	6	27942035.	442615174.	63	60	550573.59	3933725.86
10	7	26151010.	414673139.	64	61	487410.93	3383152.27
11	8	24575834.	388522129.	65	62	429788.29	2895741.34
12	9	23139490.	363946295.	66	63	377821.65	2465953.05
13	10	21815978.	340806805.	67	64	331358.32	2088131.40
14	11	20576663.	318990827.	68	65	289577.55	1756773.08
15	12	19394609.	298414164.	69	66	252172.82	1467195.53
16	13	18264928.	279019555.	70	67	218664.23	1215022.71
17	14	17188940.	260754627.	71	68	188729.93	996358.48
18	15	16167410.	243565687.	72	69	161307.30	807628.55
19	16	15195675.	227398277.	73	70	136129.23	646321.25
20	17	14274203.	212202602.	74	71	113346.65	510192.02
21	18	13405159.	197928399.	75	72	92435.661	396845.366
22	19	12589874.	184523240.	76	73	74200.008	304409.705
23	20	11823015.	171933366.	77	74	58438.251	230209.697
24	21	11101760.	160110351.	78	75	45197.068	171771.446
25	22	10425190.	149008591.	79	76	34696.342	126574.378
26	23	9787196.6	138583401.5	80	77	26131.745	91878.036
27	24	9187291.8	128796204.9	81	78	19509.809	65746.291
28	25	8620249.6	119608913.1	82	79	14343.037	46236.482
29	26	8078822.0	110988663.5	83	80	10348.302	31893.445
30	27	7562365.2	102909841.5	84	81	7349.8759	21545.1431
31	28	7074107.9	95347476.3	85	82	5100.4396	14195.2672
32	29	6610478.8	88273368.4	86	83	3442.5035	9094.8276
33	30	6170669.5	81662889.6	87	84	2245.3206	5652.3241
34	31	5758983.4	75492220.1	88	85	1409.9044	3407.0035
35	32	5373650.0	69733236.7	89	86	863.9667	1997.0991
36	33	5013954.7	64359586.7	90	87	520.64668	1133.13238
37	34	4677316.8	59345632.0	91	88	287.37636	612.48570
38	35	4361495.1	54668315.2	92	89	152.51912	325.10934
39	36	4065289.1	50306820.1	93	90	82.04975	172.59022
40	37	3785350.5	46241531.0	94	91	42.80112	90.54047
41	38	3519587.0	42456180.5	95	92	21.83731	47.73935
42	39	3268898.3	38936593.5	96	93	11.48018	25.90204
43	40	3032047.2	35667695.2	97	94	6.33827	14.42186
44	41	2808549.7	32635648.0	98	95	3.52126	8.08359
45	42	2598927.1	29827098.3	99	96	2.02013	4.56233
46	43	2403467.5	27228171.2	100	97	1.23193	2.54220
47	44	2222217.6	24824703.7	101	98	.70975	1.31027
48	45	2054630.6	22602486.1	102	99	.37936	.60052
49	46	1900949.8	20547855.5	103	100	.17736	.22116
50	47	1759198.8	18646905.7	104	101	.04379	.04379
51	48	1628807.7	16887706.9	Difference of Age 102 years.			
52	49	1507766.9	15258899.2				
53	50	1394790.1	13751132.3				
54	51	1289384.2	12356342.2				
55	52	1189982.7	11066958.0	102	0	344.87480	560.28405
56	53	1096085.6	9876975.3	103	1	166.74203	215.40925
				104	2	48.66722	48.66722

Difference of Age 103 years.

COMMUTATION TABLES FOR JOINT ANNUITIES.

Difference of Age 4 years.

AGES.		D _{x,y}	N _{x,y}	AGES.		D _{x,y}	N _{x,y}
(x)	(y)			(x)	(y)		
4	0	57572719.	652976641.	58	54	939491.7	8024864.9
5	1	45060132.	595403922.	59	55	858343.65	7085373.24
6	2	38752909.	550343790.	60	56	780119.64	6227029.59
7	3	34087657.	511590881.	61	57	704446.09	5446909.95
8	4	30957907.	477503224.	62	58	633374.53	4742463.86
9	5	28448474.	446545317.	63	59	566593.57	4109089.33
10	6	26476212.	418096843.	64	60	504299.36	3542495.76
11	7	24793918.	391620631.	65	61	445739.19	3038196.40
12	8	23292732.	366826713.	66	62	392504.43	2592457.21
13	9	21927422.	343533981.	67	63	344536.74	2199952.78
14	10	20669451.	321606559.	68	64	301571.31	1855416.04
15	11	19488552.	300937108.	69	65	262977.74	1553844.73
16	12	18356712.	281448556.	70	66	228370.37	1290866.99
17	13	17278480.	263091844.	71	67	197496.46	1062496.62
18	14	16257229.	245813364.	72	68	169165.04	865000.16
19	15	15290329.	229556135.	73	69	143159.64	695835.12
20	16	14370603.	214265806.	74	70	119519.24	552675.48
21	17	13498492.	199895203.	75	71	98215.585	433156.238
22	18	12678145.	186396711.	76	72	79624.747	334940.653
23	19	11906494.	173718566.	77	73	63390.106	255315.906
24	20	11180705.	161812072.	78	74	49676.299	191925.800
25	21	10498106.	150631367.	79	75	38360.642	142249.501
26	22	9856132.	140133261.	80	76	29131.415	103888.859
27	23	9252460.9	130277128.9	81	77	21858.064	74757.444
28	24	8681833.3	121024668.0	82	78	16094.454	52899.380
29	25	8138347.4	112342834.7	83	79	11738.211	36804.926
30	26	7618498.8	104204487.3	84	80	8368.4967	25066.7150
31	27	7129489.7	96585988.5	85	81	5888.3696	16698.2183
32	28	6668485.8	89456498.8	86	82	4006.1237	10809.8487
33	29	6231916.8	82788013.0	87	83	2644.3001	6803.7250
34	30	5817759.0	76556096.2	88	84	1676.0436	4159.4249
35	31	5429058.5	70738337.2	89	85	1047.5890	2483.3813
36	32	5065267.1	65309278.7	90	86	645.53153	1435.79233
37	33	4724806.6	60244011.6	91	87	366.65260	790.26080
38	34	4406232.5	55519205.0	92	88	195.49411	423.60820
39	35	4107420.4	51112972.5	93	89	104.58454	228.11409
40	36	3825719.9	47005562.1	94	90	57.88342	123.52955
41	37	3558211.7	43179832.2	95	91	30.57223	65.64613
42	38	3305813.4	39621620.5	96	92	15.94470	35.07391
43	39	3068491.5	36315807.1	97	93	8.55666	19.12920
44	40	2845555.9	33247315.6	98	94	4.69501	10.57254
45	41	2635227.9	30401759.7	99	95	2.63496	5.87753
46	42	2438515.0	27766531.8	100	96	1.57413	3.24258
47	43	2255101.6	25328016.8	101	97	.91254	1.66845
48	44	2085491.3	23072915.2	102	98	.48282	.75591
49	45	1929523.2	20987423.9	103	99	.21678	.27308
50	46	1785655.8	19057900.7	104	100	.05631	.05631
51	47	1652946.1	17272244.9	Difference of Age 101 years.			
52	48	1529074.5	15619298.8				
53	49	1414140.1	14090224.3				
54	50	1306920.7	12676084.2				
55	51	1207236.9	11369163.5				
56	52	1113004.6	10161926.6	101	0	506.96600	997.57415
57	53	1024057.1	9048922.0	102	1	291.79857	490.60815
				103	2	153.30176	198.80958
				104	3	45.50782	45.50782

Difference of Age 101 years.

COMMUTATION TABLES FOR JOINT ANNUITIES.

Difference of Age 49 years.

AGES.		D_{xy}	N_{xy}	AGES.		D_{xy}	N_{xy}
(x)	(y)			(x)	(y)		
49	0	6523887.1	63890238.6	103	54	218.77729	287.71347
50	1	5234933.8	57366351.5	104	55	68.93618	68.93618
51	2	4565759.3	52131417.7	Difference of Age 56 years.			
52	3	4046479.5	47565658.4	56	0	4448288.9	37604788.3
53	4	3686312.9	43519178.9	57	1	3550179.8	33156499.4
54	5	3387130.1	39832866.0	58	2	3072893.1	29606319.6
55	6	3144829.3	36445735.9	59	3	2696011.4	26533426.5
56	7	2933201.7	33300906.6	60	4	2423442.7	23837415.1
57	8	2742462.5	30367704.9	61	5	2187507.7	21413972.4
58	9	2564892.0	27625242.4	62	6	1991998.8	19226464.7
59	10	2394313.1	25060350.4	63	7	1821086.7	17234465.9
60	11	2227087.7	22666037.3	64	8	1669255.0	15413379.2
61	12	2059739.5	20438949.6	65	9	1531078.9	13744124.2
62	13	1900097.1	18379210.1	66	10	1404528.8	12213045.3
63	14	1749557.8	16479113.0	67	11	1287304.5	10808516.5
64	15	1608982.1	14729555.2	68	12	1177147.5	9521212.0
65	16	1476372.3	13120573.1	69	13	1073900.4	8344064.5
66	17	1352130.7	11644200.8	70	14	976798.58	7270164.08
67	18	1236260.7	10292070.1	71	15	885801.67	6293365.50
68	19	1128038.3	9055809.4	72	16	796646.08	5407563.83
69	20	1027018.4	7927771.1	73	17	709030.36	4610917.75
70	21	932391.65	6900752.68	74	18	624157.18	3901887.39
71	22	844323.66	5968361.03	75	19	542234.71	3277730.21
72	23	758728.73	5124037.37	76	20	468269.78	2735495.50
73	24	675055.28	4365308.64	77	21	401044.24	2267225.72
74	25	594141.86	3690253.36	78	22	341801.00	1866181.48
75	26	515976.16	3096111.50	79	23	290841.71	1524380.48
76	27	445432.97	2580135.34	80	24	244805.30	1233538.77
77	28	381214.20	2134702.37	81	25	205271.39	988733.47
78	29	324326.75	1753488.17	82	26	169714.70	783462.08
79	30	275185.13	1429161.42	83	27	139195.25	613747.38
80	31	230913.29	1153976.29	84	28	112764.37	474552.13
81	32	193015.86	923063.00	85	29	90416.69	361787.76
82	33	159129.34	730047.14	86	30	70995.684	271371.073
83	34	130160.65	570917.80	87	31	54502.240	200375.389
84	35	105191.82	440757.15	88	32	40655.765	145873.149
85	36	84212.245	335565.327	89	33	30189.607	105217.384
86	37	66075.564	251353.082	90	34	22544.812	75027.777
87	38	50686.595	185277.518	91	35	15866.539	52482.965
88	39	37772.795	134590.923	92	36	10785.570	36616.426
89	40	27999.315	96818.128	93	37	7388.1412	25830.8565
90	41	20846.772	68818.813	94	38	5205.0871	18442.7153
91	42	14617.811	47972.041	95	39	3711.7525	13237.6282
92	43	9895.4104	33354.2304	96	40	2703.7297	9525.8757
93	44	6750.7716	23458.8200	97	41	2008.1197	6822.1460
94	45	4737.0902	16708.0484	98	42	1481.1113	4814.0263
95	46	3365.5825	11970.9582	99	43	1102.8891	3332.9150
96	47	2444.2782	8605.3757	100	44	855.00523	2230.02591
97	48	1812.4794	6161.0975	101	45	629.96488	1375.02068
98	49	1336.5980	4348.6181	102	46	426.26098	745.05580
99	50	995.9752	3012.0201	103	47	242.27617	318.79482
100	51	773.03307	2016.04493	104	48	76.51865	76.51865
101	52	569.86034	1243.01186				
102	53	385.43805	673.15152				

Difference of Age 56 years..

COMMUTATION TABLES FOR JOINT ANNUITIES.

Difference of Age 50 years.

AGES.		D _{x,y}	N _{x,y}	AGES.		D _{x,y}	N _{x,y}
(x)	(y)			(x)	(y)		
50	0	6187133.7	59536890.6	104	54	70.12095	70.12095
51	1	4966048.2	53349756.9	Difference of Age 55 years.			
52	2	4327407.8	48383708.7	55	0	4710649.0	40801086.4
53	3	3831700.5	44056300.9	56	1	3763697.2	36090437.4
54	4	3487293.9	40224600.4	57	2	3264017.1	32326740.2
55	5	3201828.1	36737306.5	58	3	2873405.9	29062723.1
56	6	2969677.7	33535478.4	59	4	2593715.6	26189317.2
57	7	2766798.9	30565800.7	60	5	2353835.4	23595601.6
58	8	2581878.0	27799001.8	61	6	2148565.8	21241766.2
59	9	2406544.1	25217123.8	62	7	1967531.4	19093200.4
60	10	2237130.6	22810579.7	63	8	1805068.6	17125669.0
61	11	2069716.4	20573449.1	64	9	1658273.1	15320600.4
62	12	1909645.3	18503732.7	65	10	1523297.4	13662327.3
63	13	1758671.5	16594087.4	66	11	1398223.6	12139029.9
64	14	1617920.9	14835415.9	67	12	1281099.2	10740806.3
65	15	1485568.7	13217495.0	68	13	1171261.7	9459707.1
66	16	1361262.4	11731926.3	69	14	1068335.3	8288445.4
67	17	1244868.1	10370663.9	70	15	971401.91	7220110.10
68	18	1135947.3	9125795.8	71	16	880318.14	6248708.19
69	19	1034270.0	7989848.5	72	17	791302.01	5368390.05
70	20	939021.85	6955578.48	73	18	704127.91	4577088.04
71	21	850229.00	6016556.63	74	19	619811.53	3872960.13
72	22	764072.78	5166327.63	75	20	538432.97	3253148.60
73	23	679843.71	4402254.85	76	21	464963.44	2714715.63
74	24	598386.44	3722411.14	77	22	398258.75	2249752.19
75	25	519777.90	3124024.70	78	23	339410.39	1851493.44
76	26	448739.31	2604246.80	79	24	288793.19	1512083.05
77	27	384198.65	2155507.49	80	25	243068.79	1223289.86
78	28	327172.72	1771308.84	81	26	203770.00	980221.07
79	29	277916.50	1444136.12	82	27	168464.23	776451.07
80	30	233269.97	1166219.62	83	28	138113.98	607986.84
81	31	195006.07	932949.65	84	29	111783.47	469872.86
82	32	160757.85	737943.58	85	30	89528.074	358089.391
83	33	131482.20	577185.73	86	31	70278.428	268561.317
84	34	106270.81	445703.53	87	32	53945.995	198282.889
85	35	85084.993	339432.718	88	33	40243.913	144336.894
86	36	66780.236	254347.725	89	34	29886.166	104092.981
87	37	51242.840	187567.489	90	35	22315.910	74206.815
88	38	38199.357	136324.649	91	36	15703.790	51890.905
89	39	28335.859	98125.292	92	37	10671.760	36187.115
90	40	21121.455	69789.433	93	38	7307.9424	25515.3549
91	41	14821.987	48667.978	94	39	5146.9633	18207.4125
92	42	10039.706	33845.991	95	40	3667.6682	13060.4492
93	43	6850.6684	23806.2851	96	41	2668.5679	9392.7810
94	44	4808.2418	16955.6167	97	42	1980.4575	6724.2131
95	45	3416.1710	12147.3749	98	43	1459.8241	4743.7556
96	46	2481.0383	8731.2039	99	44	1086.8067	3283.9315
97	47	1839.3398	6250.1656	100	45	842.35301	2197.12485
98	48	1355.4867	4410.8258	101	46	620.63601	1354.77184
99	49	1009.7925	3055.3391	102	47	419.94533	734.13583
100	50	783.54689	2045.54661	103	48	238.73814	314.19050
101	51	578.12305	1261.99972	104	49	75.45236	75.45236
102	52	391.38759	683.87667				
103	53	222.36813	292.48908				

Difference of Age 55 years.

COMMUTATION TABLES FOR JOINT ANNUITIES.

Difference of Age 7 years.

AGES.		D _{x,y}	N _{x,y}	AGES.		D _{x,y}	N _{x,y}
(x)	(y)			(x)	(y)		
7	0	46862327.	548067941.	61	54	743761.51	6016118.40
8	1	37429959.	501205614.	62	55	671456.13	5272356.89
9	2	32558582.	463775655.	63	56	604527.68	4600900.76
10	3	28847808.	431217073.	64	57	543198.10	3996373.08
11	4	26312987.	402369265.	65	58	486376.03	3453174.98
12	5	24222873.	376056278.	66	59	433431.26	2966798.95
13	6	22545429.	351833405.	67	60	384072.02	2533367.69
14	7	21098199.	329287976.	68	61	337840.47	2149295.67
15	8	19806745.	308189777.	69	62	295828.17	1811455.20
16	9	18623458.	288383032.	70	63	257883.33	1515627.03
17	10	17528106.	269759574.	71	64	224009.88	1257743.70
18	11	16503590.	252231468.	72	65	192802.15	1033733.82
19	12	15533033.	235727878.	73	66	164080.80	840931.67
20	13	14616196.	220194845.	74	67	137937.45	676850.87
21	14	13750273.	205578649.	75	68	114218.21	538913.42
22	15	12932693.	191828376.	76	69	93818.239	424695.215
23	16	12154991.	178895683.	77	70	76214.144	330876.976
24	17	11417537.	166740692.	78	71	61441.029	254662.832
25	18	10722061.	155323155.	79	72	49078.721	193221.803
26	19	10066221.	144601094.	80	73	38399.628	144143.082
27	20	9449519.9	134534873.3	81	74	29610.519	105743.454
28	21	8866584.2	125085353.4	82	75	22224.411	76132.935
29	22	8312770.1	116218769.2	83	76	16450.868	53908.524
30	23	7784288.6	107905999.1	84	77	11933.669	37457.656
31	24	7287020.3	100121710.5	85	78	8533.5631	25523.9874
32	25	6820464.3	92834690.2	86	79	5973.2685	16990.4243
33	26	6382847.8	86014225.9	87	80	4044.9727	11017.1558
34	27	5973463.0	79631378.1	88	81	2651.8875	6972.1831
35	28	5587507.3	73657915.1	89	82	1706.7462	4320.2956
36	29	5221036.9	68070407.8	90	83	1095.8205	2613.5494
37	30	4871593.4	62849370.9	91	84	655.26764	1517.72886
38	31	4542885.1	57977777.5	92	85	374.97794	862.46122
39	32	4234580.4	53434892.4	93	86	212.05815	487.48328
40	33	3944665.4	49200312.0	94	87	120.65840	275.42513
41	34	3670697.6	45255646.6	95	88	67.55007	154.76674
42	35	3412740.0	41584949.0	96	89	38.47988	87.21666
43	36	3170655.1	38172209.0	97	90	22.50084	48.73679
44	37	2944239.3	35001553.9	98	91	12.32441	26.23594
45	38	2732556.1	32057314.6	99	92	6.58739	13.91154
46	39	2535265.8	29324758.5	100	93	3.69578	7.32415
47	40	2350511.6	26789492.7	101	94	2.02786	3.62836
48	41	2177204.3	24438981.1	102	95	1.03462	1.60050
49	42	2016468.1	22261776.8	103	96	.45326	.56588
50	43	1866944.0	20245308.7	104	97	.11261	.11261
51	44	1728604.1	18378364.7	Difference of Age 98 years.			
52	45	1598747.0	16649760.6	98	0	1173.7530	3235.12264
53	46	1477265.7	15051013.6	99	1	743.14528	2061.36964
54	47	1363691.7	13573747.9	100	2	532.39795	1318.22436
55	48	1258164.6	12210056.2	101	3	368.76707	785.82641
56	49	1160377.5	10951891.6	102	4	241.34338	417.05934
57	50	1069289.8	9791514.1	103	5	133.94936	175.71596
58	51	983711.08	8722224.28	104	6	41.76660	41.76660
59	52	901123.85	7738513.20				
60	53	821270.95	6837389.35				

Difference of Age 98 years.

COMMUTATION TABLES FOR JOINT ANNUITIES.

Difference of Age 8 years.

AGES.		D _{x,y}	N _{x,y}	AGES.		D _{x,y}	N _{x,y}
(x)	(y)			(x)	(y)		
8	0	44238221.	517715735.	62	54	682996.01	5434782.48
9	1	35413056.	473477514.	63	55	615560.31	4751786.47
10	2	30850577.	438064458.	64	56	553718.76	4136226.16
11	3	27350767.	407213881.	65	57	496756.78	3582507.40
12	4	24939189.	379863114.	66	58	444183.22	3085750.62
13	5	22954056.	354923925.	67	59	395247.33	2641567.40
14	6	21360566.	331969869.	68	60	349546.39	2246320.07
15	7	19982508.	310609303.	69	61	306807.36	1896773.68
16	8	18746792.	290626795.	70	62	267905.12	1589966.32
17	9	17617646.	271880003.	71	63	232918.96	1322061.20
18	10	16578011.	254262357.	72	64	200787.66	1089142.24
19	11	15608271.	237684346.	73	65	171111.21	888354.58
20	12	14689644.	222076075.	74	66	144060.26	717243.37
21	13	13821900.	207386431.	75	67	119523.67	573183.11
22	14	13004542.	193564531.	76	68	98388.395	453659.445
23	15	12230705.	180559989.	77	69	80150.233	355271.050
24	16	11494646.	168329284.	78	70	64786.961	275120.817
25	17	10796713.	156834638.	79	71	52147.571	210333.856
26	18	10136798.	146037925.	80	72	41207.012	158186.285
27	19	9516240.6	135901126.9	81	73	32119.613	116979.273
28	20	8929634.2	126384886.3	82	74	24426.949	84859.660
29	21	8370911.1	117455252.1	83	75	18188.253	60432.711
30	22	7839116.8	109084341.0	84	76	13303.539	42244.458
31	23	7338710.0	101245224.2	85	77	9560.6861	28940.9193
32	24	6869190.1	93906514.2	86	78	6702.6594	19380.2332
33	25	6429877.0	87037324.1	87	79	4588.2639	12677.5738
34	26	6017802.5	80607447.1	88	80	3019.4131	8089.3099
35	27	5631250.8	74589644.6	89	81	1970.4091	5069.8968
36	28	5266851.6	68958393.8	90	82	1275.2326	3099.4877
37	29	4919946.6	63691542.2	91	83	771.70461	1824.25513
38	30	4589249.4	58771595.6	92	84	445.76029	1052.55052
39	31	4278243.8	54182346.2	93	85	257.12773	606.79023
40	32	3985034.8	49904102.4	94	86	149.60011	349.66250
41	33	3707967.0	45919067.6	95	87	86.18457	200.06239
42	34	3447745.7	42211100.6	96	88	49.32227	113.87782
43	35	3203514.7	38763354.9	97	89	28.68066	64.55555
44	36	2975638.5	35559840.2	98	90	16.66729	35.87489
45	37	2762543.7	32584201.7	99	91	9.22234	19.20760
46	38	2563896.1	29821658.0	100	92	5.13303	9.98525
47	39	2378764.0	27257761.9	101	93	2.73762	4.85222
48	40	2205891.7	24878997.9	102	94	1.37950	2.11461
49	41	2044633.3	22673106.2	103	95	.59121	.73511
50	42	1894167.9	20628472.9	104	96	.14389	.14389
51	43	1754183.7	18734305.0	Difference of Age 97 years.			
52	44	1622760.4	16980121.3				
53	45	1499470.7	15357360.9	97	0	1584.5666	4520.76309
54	46	1384200.6	13857890.2	98	1	993.11242	2936.19649
55	47	1276810.2	12473689.6	99	2	683.24396	1943.08407
56	48	1176775.9	11196879.4	100	3	497.83554	1259.84011
57	49	1084124.1	10020103.5	101	4	354.77480	762.00457
58	50	997090.27	8935979.40	102	5	234.41140	407.22977
59	51	914189.73	7938889.13	103	6	131.56480	172.81837
60	52	833947.89	7024699.40	104	7	41.25357	41.25357
61	53	755969.03	6190751.51				

Difference of Age 97 years.

COMPUTATION TABLE FOR JOINT ANNUITIES

Difference of Age 9 years.

AGE.		D ₂		N ₂		AGE.		D ₂		N ₂	
x	y					x	y				
1	0	41554.77	447425.02			62	34	43712.35	429436.32		
2	1	41555.97	447425.02			63	35	43692.13	429412.77		
3	2	41557.42	447425.02			64	36	43671.46	429389.64		
4	3	41559.01	447425.02			65	37	43650.45	429366.68		
5	4	41560.71	447425.02			66	38	43629.17	429343.23		
6	5	41562.51	447425.02			67	39	43607.70	429319.16		
7	6	41564.42	447425.02			68	40	43586.00	429295.06		
8	7	41566.43	447425.02			69	41	43564.29	429270.96		
9	8	41568.54	447425.02			70	42	43542.59	429246.07		
10	9	41570.75	447425.02			71	43	43520.87	429221.48		
11	10	41573.06	447425.02			72	44	43499.12	429196.31		
12	11	41575.47	447425.02			73	45	43477.34	429171.59		
13	12	41577.97	447425.02			74	46	43455.52	429147.15		
14	13	41580.56	447425.02			75	47	43433.65	429122.03		
15	14	41583.24	447425.02			76	48	43411.72	429097.19		
16	15	41586.01	447425.02			77	49	43389.73	429072.68		
17	16	41588.87	447425.02			78	50	43367.68	429048.49		
18	17	41591.82	447425.02			79	51	43345.57	429024.66		
19	18	41594.86	447425.02			80	52	43323.40	429001.19		
20	19	41597.99	447425.02			81	53	43301.17	428977.99		
21	20	41601.21	447425.02			82	54	43278.88	428955.06		
22	21	41604.52	447425.02			83	55	43256.53	428932.40		
23	22	41607.92	447425.02			84	56	43234.12	428909.99		
24	23	41611.41	447425.02			85	57	43211.65	428887.84		
25	24	41614.98	447425.02			86	58	43189.12	428865.95		
26	25	41618.64	447425.02			87	59	43166.53	428844.32		
27	26	41622.39	447425.02			88	60	43143.88	428822.95		
28	27	41626.23	447425.02			89	61	43121.17	428801.85		
29	28	41630.16	447425.02			90	62	43098.40	428781.00		
30	29	41634.18	447425.02			91	63	43075.57	428760.40		
31	30	41638.29	447425.02			92	64	43052.68	428740.05		
32	31	41642.49	447425.02			93	65	43029.73	428719.95		
33	32	41646.78	447425.02			94	66	43006.72	428699.99		
34	33	41651.16	447425.02			95	67	42983.65	428680.28		
35	34	41655.63	447425.02			96	68	42960.52	428660.81		
36	35	41660.19	447425.02			97	69	42937.33	428641.58		
37	36	41664.84	447425.02			98	70	42914.08	428622.59		
38	37	41669.58	447425.02			99	71	42890.77	428603.84		
39	38	41674.41	447425.02			100	72	42867.40	428585.33		
40	39	41679.33	447425.02			101	73	42843.97	428567.06		
41	40	41684.34	447425.02			102	74	42820.48	428549.02		
42	41	41689.44	447425.02			103	75	42796.93	428531.21		
43	42	41694.63	447425.02			104	76	42773.32	428513.62		
44	43	41699.91	447425.02			105	77	42749.65	428496.25		
45	44	41705.28	447425.02			106	78	42725.92	428479.10		
46	45	41710.74	447425.02			107	79	42702.13	428462.17		
47	46	41716.29	447425.02			108	80	42678.28	428445.46		
48	47	41721.93	447425.02			109	81	42654.37	428428.97		
49	48	41727.66	447425.02			110	82	42630.40	428412.70		
50	49	41733.48	447425.02			111	83	42606.37	428396.65		
51	50	41739.39	447425.02			112	84	42582.28	428380.82		
52	51	41745.39	447425.02			113	85	42558.13	428365.21		
53	52	41751.48	447425.02			114	86	42533.92	428349.81		
54	53	41757.66	447425.02			115	87	42509.65	428334.62		
55	54	41763.93	447425.02			116	88	42485.32	428319.64		
56	55	41770.29	447425.02			117	89	42460.93	428304.87		
57	56	41776.74	447425.02			118	90	42436.48	428290.31		
58	57	41783.28	447425.02			119	91	42411.97	428275.96		
59	58	41789.91	447425.02			120	92	42387.40	428261.81		
60	59	41796.63	447425.02			121	93	42362.77	428247.87		
61	60	41803.44	447425.02			122	94	42338.08	428234.13		
62	61	41810.34	447425.02			123	95	42313.33	428220.59		
63	62	41817.33	447425.02			124	96	42288.52	428207.25		
64	63	41824.41	447425.02			125	97	42263.65	428194.11		
65	64	41831.58	447425.02			126	98	42238.72	428181.17		
66	65	41838.84	447425.02			127	99	42213.73	428168.42		
67	66	41846.19	447425.02			128	100	42188.68	428155.87		
68	67	41853.63	447425.02			129	101	42163.57	428143.51		
69	68	41861.16	447425.02			130	102	42138.40	428131.34		
70	69	41868.78	447425.02			131	103	42113.17	428119.36		
71	70	41876.49	447425.02			132	104	42087.88	428107.57		
72	71	41884.29	447425.02			133	105	42062.53	428095.97		
73	72	41892.18	447425.02			134	106	42037.12	428084.56		
74	73	41900.16	447425.02			135	107	42011.65	428073.34		
75	74	41908.23	447425.02			136	108	41986.12	428062.31		
76	75	41916.39	447425.02			137	109	41960.53	428051.47		
77	76	41924.64	447425.02			138	110	41934.88	428040.82		
78	77	41932.98	447425.02			139	111	41909.17	428030.36		
79	78	41941.41	447425.02			140	112	41883.40	428020.09		
80	79	41949.93	447425.02			141	113	41857.57	428009.99		
81	80	41958.54	447425.02			142	114	41831.68	427999.87		
82	81	41967.24	447425.02			143	115	41805.73	427989.92		
83	82	41976.03	447425.02			144	116	41779.72	427980.14		
84	83	41984.91	447425.02			145	117	41753.65	427970.52		
85	84	41993.88	447425.02			146	118	41727.52	427961.06		
86	85	42002.94	447425.02			147	119	41701.33	427951.76		
87	86	42012.09	447425.02			148	120	41675.08	427942.62		
88	87	42021.33	447425.02			149	121	41648.77	427933.64		
89	88	42030.66	447425.02			150	122	41622.40	427924.82		
90	89	42039.98	447425.02			151	123	41595.97	427916.16		
91	90	42049.39	447425.02			152	124	41569.48	427907.66		
92	91	42058.89	447425.02			153	125	41542.93	427899.32		
93	92	42068.48	447425.02			154	126	41516.32	427891.14		
94	93	42078.16	447425.02			155	127	41489.65	427883.12		
95	94	42087.93	447425.02			156	128	41462.92	427875.26		
96	95	42097.79	447425.02			157	129	41436.13	427867.56		
97	96	42107.74	447425.02			158	130	41409.28	427859.92		
98	97	42117.78	447425.02			159	131	41382.37	427852.44		
99	98	42127.91	447425.02			160	132	41355.40	427845.12		
100	99	42138.13	447425.02			161	133	41328.37	427837.96		
101	100	42148.44	447425.02			162	134	41301.28	427830.96		
102	101	42158.84	447425.02			163	135	41274.13	427824.12		
103	102	42169.33	447425.02			164	136	41246.92	427817.44		
104	103	42179.91	447425.02			165	137	41219.65	427810.92		
105	104	42190.58	447425.02			166	138	41192.32	427804.56		
106	105	42201.34	447425.02			167	139	41164.93	427798.36		
107	106	42212.19	447425.02			168	140	41137.48	427792.32		
108	107	42223.13	447425.0								

COMMUTATION TABLES FOR JOINT ANNUITIES.

Difference of Age 10 years.

AGES.		D_{xy}	N_{xy}	AGES.		D_{xy}	N_{xy}
(x)	(y)			(x)	(y)		
10	0	39658796.	462016687.	64	54	573514.21	4398196.89
11	1	31813973.	422357891.	65	55	515619.35	3824682.68
12	2	27722485.	390543918.	66	56	462450.00	3309063.33
13	3	24564926.	362821433.	67	57	413697.12	2846613.33
14	4	22390839.	338256507.	68	58	368640.47	2432916.21
15	5	20597681.	315865668.	69	59	326674.46	2064275.74
16	6	19148345.	295267987.	70	60	287475.21	1737601.28
17	7	17891692.	276119642.	71	61	250950.94	1450126.07
18	8	16773047.	258227950.	72	62	216886.45	1199175.13
19	9	15758747.	241454903.	73	63	185285.43	982288.68
20	10	14827360.	225696156.	74	64	156455.21	797003.25
21	11	13958643.	210868796.	75	65	130177.71	640548.04
22	12	13137974.	196910153.	76	66	107528.70	510370.33
23	13	12362719.	183772179.	77	67	87958.931	402841.628
24	14	11630503.	171409460.	78	68	71451.842	314882.697
25	15	10937335.	159778957.	79	69	57827.237	243430.855
26	16	10276310.	148841622.	80	70	46168.006	185603.618
27	17	9649682.2	138565311.7	81	71	36623.113	139435.612
28	18	9055734.2	128915629.5	82	72	28433.977	102812.499
29	19	8489961.5	119859895.3	83	73	21684.742	74378.522
30	20	7950078.4	111369933.8	84	74	16166.215	52693.780
31	21	7442089.5	103419855.4	85	75	11783.774	36527.565
32	22	6966641.9	95977765.9	86	76	8371.417	24743.791
33	23	6521747.9	89011124.0	87	77	5768.2244	16372.3743
34	24	6105450.4	82489376.1	88	78	3843.1775	10604.1499
35	25	5714849.6	76383925.7	89	79	2544.8174	6760.9724
36	26	5347485.4	70669076.1	90	80	1676.2712	4216.1550
37	27	5001974.5	65321590.7	91	81	1036.7845	2539.8838
38	28	4675470.7	60319616.2	92	82	610.91911	1503.09929
39	29	4364804.5	55644145.5	93	83	859.97882	892.18018
40	30	4067215.3	51279341.0	94	84	215.63612	532.20186
41	31	3784538.6	47212125.7	95	85	129.56802	316.56524
42	32	3518393.6	43427587.1	96	86	78.02274	186.99722
43	33	3269234.0	39909193.5	97	87	46.90317	108.97448
44	34	3037315.6	36639959.5	98	88	27.23107	62.07131
45	35	2820940.7	33602643.9	99	89	15.89756	34.84024
46	36	2619675.9	30781703.2	100	90	9.71854	18.94268
47	37	2432026.8	28162027.3	101	91	5.32314	9.22414
48	38	2257616.1	25730000.5	102	92	2.58656	3.90099
49	39	2096473.7	23472384.4	103	93	1.06418	1.31443
50	40	1945931.6	21375910.7	104	94	.25025	.25025
51	41	1804622.3	19429979.1	Difference of Age 95 years.			
52	42	1670787.0	17625356.8	95	0	2911.6410	8611.9633
53	43	1544515.1	15954569.8	96	1	1798.7748	5700.3223
54	44	1426110.0	14410054.7	97	2	1232.6344	3901.5475
55	45	1315493.0	12983944.7	98	3	853.78793	2668.91311
56	46	1212175.5	11668451.7	99	4	614.64728	1815.12518
57	47	1115738.3	10456276.2	100	5	465.18947	1200.47790
58	48	1025209.3	9340537.9	101	6	338.45050	735.28843
59	49	939478.52	8315328.58	102	7	227.41044	396.83793
60	50	857546.51	7375850.06	103	8	128.80579	169.42749
61	51	778768.38	6518303.55	104	9	40.62170	40.62170
62	52	704921.77	5739535.17				
63	53	636416.51	5034613.40				

Difference of Age 95 years.

COMMUTATION TABLES FOR JOINT ANNUITIES.

Difference of Age 11 years.

AGES.		$D_{x,y}$	$N_{x,y}$	AGES.		$D_{x,y}$	$N_{x,y}$
(x)	(y)			(x)	(y)		
11	0	37600725.	436344784.	65	54	524480.97	3937769.69
12	1	30152969.	398744059.	66	55	470889.71	3413288.72
13	2	26270355.	368591090.	67	56	421709.60	2942399.01
14	3	23273930.	342320735.	68	57	376508.38	2520689.41
15	4	21206793.	319046805.	69	58	334778.15	2144181.03
16	5	19495401.	297840012.	70	59	295839.85	1809402.88
17	6	18114185.	278344611.	71	60	259646.20	1513563.03
18	7	16921889.	260230426.	72	61	224935.84	1253916.83
19	8	15863110.	243308537.	73	62	192485.94	1028980.99
20	9	14903103.	227445427.	74	63	162677.58	836495.05
21	10	14021588.	212542324.	75	64	135569.43	673817.47
22	11	13201611.	198520736.	76	65	112136.02	538248.04
23	12	12424843.	185319125.	77	66	91863.279	426112.021
24	13	11691088.	172894282.	78	67	74770.791	334248.742
25	14	10998098.	161203194.	79	68	60644.168	259477.951
26	15	10340322.	150205096.	80	69	48552.358	198833.783
27	16	9714851.2	139864773.8	81	70	38617.521	150281.425
28	17	9118784.1	130149922.6	82	71	30211.930	111663.904
29	18	8549486.8	121031138.5	83	72	23270.106	81451.974
30	19	8006212.0	112481651.7	84	73	17536.084	58181.868
31	20	7495009.9	104475439.7	85	74	12951.599	40645.784
32	21	7015367.8	96980429.8	86	75	9255.527	27694.185
33	22	6567683.5	89965062.0	87	76	6430.3605	18438.6578
34	23	6148758.8	83397378.5	88	77	4305.7528	12008.2973
35	24	5755676.9	77248619.7	89	78	2855.5629	7702.5445
36	25	5386886.0	71492942.8	90	79	1901.4157	4846.9816
37	26	5039102.9	66106056.8	91	80	1180.4727	2945.5659
38	27	4712074.0	61066953.9	92	81	705.29558	1765.09324
39	28	4403105.7	56354879.9	93	82	418.91596	1059.79766
40	29	4107584.7	51951774.2	94	83	253.95331	640.88170
41	30	3823163.3	47844189.5	95	84	154.02581	386.92839
42	31	3554672.3	44021026.2	96	85	94.60522	232.90258
43	32	3302691.0	40466353.9	97	86	58.15359	138.29736
44	33	3068154.1	37163662.9	98	87	34.74309	80.14376
45	34	2849876.1	34095508.8	99	88	20.37699	45.40068
46	35	2646825.4	31245632.7	100	89	12.38771	25.02369
47	36	2457963.5	28598807.3	101	90	7.19892	12.63597
48	37	2282391.6	26140843.8	102	91	3.62118	5.43706
49	38	2120148.8	23858452.2	103	92	1.47803	1.81587
50	39	1969321.1	21738303.4	104	93	.33784	.33784
51	40	1828400.5	19768982.3	Difference of Age 94 years.			
52	41	1694123.9	17940581.8	94	0	4076.2972	11949.6055
53	42	1567037.3	16246457.9	95	1	2463.5394	7873.3083
54	43	1447213.4	14679420.6	96	2	1653.7844	5409.7689
55	44	1335251.9	13232207.2	97	3	1152.6137	3755.9845
56	45	1230395.8	11896955.3	98	4	821.39235	2603.37078
57	46	1132518.2	10666559.5	99	5	596.99308	1781.97843
58	47	1040402.6	9534041.3	100	6	456.90818	1184.98535
59	48	952755.13	8493638.69	101	7	334.29338	728.07717
60	49	869443.34	7540883.56	102	8	225.41016	393.78379
61	50	789360.21	6671440.22	103	9	127.95839	168.37363
62	51	715142.81	5882080.01	104	10	40.41524	40.41524
63	52	646240.08	5166937.20				
64	53	582927.43	4520697.12				

Difference of Age 94 years.

COMMUTATION TABLES FOR JOINT ANNUITIES.

Difference of Age 12 years.

AGES.		D _{xy}	N _{xy}	AGES.		D _{xy}	N _{xy}
(x)	(y)			(x)	(y)		
12	0	35637595.	411978125.	66	54	478982.59	3512724.13
13	1	28573528.	376340530.	67	55	429405.80	3033741.54
14	2	24889731.	347767002.	68	56	383800.59	2604335.74
15	3	22043185.	322877271.	69	57	341923.34	2220535.15
16	4	20071917.	300834086.	70	58	303178.63	1878611.81
17	5	18442498.	280762169.	71	59	267201.10	1575433.18
18	6	17132322.	262319671.	72	60	232729.70	1308232.08
19	7	16003878.	245187349.	73	61	199629.75	1075502.38
20	8	15001799.	229183471.	74	62	168999.50	875872.63
21	9	14093216.	214181672.	75	63	140961.15	706873.13
22	10	13261143.	200088456.	76	64	116780.48	565911.98
23	11	12485026.	186827313.	77	65	95799.369	449131.505
24	12	11749837.	174342287.	78	66	78089.739	353332.136
25	13	11055389.	162592450.	79	67	63461.098	275242.397
26	14	10397768.	151537061.	80	68	50917.483	211781.299
27	15	9775365.4	141139293.1	81	69	40611.929	160863.816
28	16	9180367.8	131363927.7	82	70	31857.200	120251.887
29	17	8609012.1	122183559.9	83	71	24725.167	88394.687
30	18	8062345.6	113574547.8	84	72	18818.141	63669.520
31	19	7547930.3	105512202.2	85	73	14049.073	44851.379
32	20	7065253.8	97964271.9	86	74	10172.791	30802.306
33	21	6613619.0	90899018.1	87	75	7109.4745	20629.5155
34	22	6192067.2	84285399.1	88	76	4800.0114	13520.0410
35	23	5796504.2	78093331.9	89	77	3199.2663	8720.0296
36	24	5425370.3	72296827.7	90	78	2133.5960	5520.7633
37	25	5076231.4	66871457.4	91	79	1339.0252	3387.1673
38	26	4747050.6	61795226.0	92	80	803.04264	2048.14209
39	27	4437576.7	57048175.4	93	81	483.63126	1245.09945
40	28	4143628.8	52610598.7	94	82	295.53155	761.46819
41	29	3861110.3	48466969.9	95	83	181.39523	465.93664
42	30	3590950.9	44605859.6	96	84	112.46329	284.54141
43	31	3336745.6	41014908.7	97	85	70.51321	172.07812
44	32	3099553.4	37678163.1	98	86	43.07673	101.56491
45	33	2878811.5	34578609.7	99	87	25.99823	58.48817
46	34	2673974.9	31699798.2	100	88	15.87817	32.48995
47	35	2483437.1	29025823.3	101	89	9.17608	16.61177
48	36	2306732.5	26542386.2	102	90	4.89722	7.43569
49	37	2143415.8	24235653.7	103	91	2.06925	2.53847
50	38	1991560.3	22092237.9	104	92	.46922	.46922
51	39	1850377.4	20100677.6	Difference of Age 93 years.			
52	40	1716446.2	18250300.2	93	0	5778.1512	16705.6584
53	41	1588925.1	16533854.0	94	1	3448.9551	10927.5072
54	42	1468316.7	14944928.9	95	2	2264.9655	7478.5521
55	43	1355010.7	13476612.2	96	3	1546.4234	5213.5866
56	44	1248876.5	12121601.5	97	4	1108.8797	3667.1632
57	45	1149541.2	10872725.0	98	5	797.79992	2558.28347
58	46	1056049.4	9723183.8	99	6	586.36543	1760.48355
59	47	966874.7	8667134.4	100	7	451.29606	1174.11812
60	48	881730.22	7700259.75	101	8	331.35298	722.82206
61	49	800311.08	6818529.53	102	9	223.92720	391.46908
62	50	724869.29	6018218.45	103	10	127.30806	167.54188
63	51	655610.28	5293349.16	104	11	40.23382	40.23382
64	52	591925.36	4637738.88				
65	53	533089.39	4045813.52				

Difference of Age 93 years.

COMMUTATION TABLES FOR JOINT ANNUITIES.

Difference of Age 13 years.

AGES.		D _{x,y}	N _{x,y}	AGES.		D _{x,y}	N _{x,y}
(x)	(y)			(x)	(y)		
13	0	33770864.	388859061.	67	54	436785.72	3120769.57
14	1	27071862.	355088197.	68	55	390804.95	2683983.85
15	2	23573541.	328016335.	69	56	348545.71	2293178.90
16	3	20863550.	304442794.	70	57	309649.39	1944633.19
17	4	18987877.	283579244.	71	58	273829.45	1634983.80
18	5	17442839.	264591367.	72	59	239501.41	1361154.35
19	6	16202895.	247148528.	73	60	206546.77	1121652.94
20	7	15134924.	230945633.	74	61	175271.65	915106.17
21	8	14186548.	215810709.	75	62	146439.14	739834.52
22	9	13328886.	201624161.	76	63	121424.95	593395.38
23	10	12541326.	188295275.	77	64	99767.203	471970.431
24	11	11806751.	175753949.	78	65	81435.672	372203.228
25	12	11110944.	163947198.	79	66	66278.030	290767.556
26	13	10451932.	152836254.	80	67	53282.609	224489.526
27	14	9829673.	142384322.	81	68	42590.251	171206.917
28	15	9237552.7	132554649.4	82	69	33502.470	128616.666
29	16	8667153.0	123317096.7	83	70	26071.641	95114.196
30	17	8118479.1	114649943.7	84	71	19994.824	69042.555
31	18	7600850.7	106531464.6	85	72	15076.196	49047.731
32	19	7115139.8	98930613.9	86	73	11034.798	33971.535
33	20	6660648.2	91815474.1	87	74	7814.0553	22936.7375
34	21	6235375.6	85154825.9	88	75	5306.9433	15122.6822
35	22	5837331.4	78919450.3	89	76	3566.5110	9815.7389
36	23	5463854.6	73082118.9	90	77	2390.4015	6249.2279
37	24	5112496.3	67618264.3	91	78	1502.5324	3858.8264
38	25	4782027.2	62505768.0	92	79	910.90146	2356.29402
39	26	4470515.8	57723740.8	93	80	550.65781	1445.39256
40	27	4176068.5	53253225.0	94	81	341.18608	894.73475
41	28	3894991.6	49077156.5	95	82	211.09397	553.54867
42	29	3626593.1	45182164.9	96	83	132.44731	342.45470
43	30	3370800.1	41555571.8	97	84	83.82357	210.00739
44	31	3131513.3	38184771.7	98	85	52.23201	126.18382
45	32	2908273.1	35053258.4	99	86	32.23429	73.95181
46	33	2701124.3	32144985.3	100	87	20.25836	41.71752
47	34	2508910.6	29443861.0	101	88	11.76161	21.45916
48	35	2330638.7	26934950.4	102	89	6.24223	9.69755
49	36	2166274.5	24604311.7	103	90	2.79841	3.45532
50	37	2013416.1	22438037.2	104	91	.65690	.65690
51	38	1871273.4	20424621.1	Difference of Age 92 years.			
52	39	1737077.4	18553347.7				
53	40	1609861.2	16816270.3	92	0	8426.4705	23697.8461
54	41	1488825.6	15206409.1	93	1	4888.8937	15271.3756
55	42	1374769.5	13717583.5	94	2	3170.9516	10382.4819
56	43	1267357.2	12342814.0	95	3	2117.9277	7211.5303
57	44	1166807.4	11075456.8	96	4	1487.7469	5093.6026
58	45	1071923.1	9908649.4	97	5	1077.0299	3605.8557
59	46	981415.77	8836726.33	98	6	783.5975	2528.8258
60	47	894797.22	7855310.56	99	7	579.16322	1745.22829
61	48	811620.99	6960513.34	100	8	447.32651	1166.06507
62	49	734925.46	6148892.35	101	9	329.17302	718.73856
63	50	664527.05	5413966.89	102	10	222.78912	389.56554
64	51	600508.00	4749439.84	103	11	126.73655	166.77642
65	52	541318.04	4148931.84	104	12	40.03987	40.03987
66	53	486844.23	3607613.80				

Difference of Age 92 years.

COMMUTATION TABLES FOR JOINT ANNUITIES.

Difference of Age 14 years.

AGES.		D_{xy}	N_{xy}	AGES.		D_{xy}	N_{xy}
(x)	(y)			(x)	(y)		
14	0	31996055.	366926331.	68	54	397521.46	2759770.76
15	1	25640280.	334930276.	69	55	354906.67	2362249.30
16	2	22312009.	309289996.	70	56	315646.68	2007342.63
17	3	19736756.	286977987.	71	57	279673.81	1691695.95
18	4	17958657.	267241231.	72	58	245442.63	1412022.14
19	5	16496566.	249282574.	73	59	212556.64	1166579.51
20	6	15323135.	232786008.	74	60	181344.68	954022.87
21	7	14312438.	217462873.	75	61	151873.99	772678.19
22	8	13417156.	203150435.	76	62	126143.73	620804.20
23	9	12605391.	189733279.	77	63	103735.03	494660.47
24	10	11859992.	177127888.	78	64	84808.587	390925.442
25	11	11164763.	165267896.	79	65	69117.862	306116.855
26	12	10504454.	154103133.	80	66	55647.734	236998.993
27	13	9880877.3	143598679.1	81	67	44568.575	181351.259
28	14	9288872.4	133717801.8	82	68	35134.471	136782.684
29	15	8721141.0	124428929.4	83	69	27418.113	101648.213
30	16	8173307.2	115707788.4	84	70	21083.694	74230.100
31	17	7653771.2	107534481.2	85	71	16018.898	53146.406
32	18	7165025.8	99880710.0	86	72	11841.549	37127.508
33	19	6707677.4	92715684.2	87	73	8476.1914	25285.9587
34	20	6279715.1	86008006.8	88	74	5832.8852	16809.7673
35	21	5878158.7	79728291.7	89	75	3943.1723	10976.8821
36	22	5502338.9	73850133.0	90	76	2664.7963	7033.7098
37	23	5148761.3	68347794.1	91	77	1683.3814	4368.9135
38	24	4816190.3	63199032.8	92	78	1022.1309	2685.5321
39	25	4503454.8	58382842.5	93	79	624.61815	1663.40123
40	26	4207066.4	53879387.7	94	80	388.47112	1038.78308
41	27	3925484.8	49672321.3	95	81	243.70435	650.31196
42	28	3658416.5	45746836.5	96	82	154.13211	406.60761
43	29	3404257.2	42088420.0	97	83	98.71850	252.47550
44	30	3163473.2	38684162.8	98	84	62.09153	153.75700
45	31	2938260.7	35520689.6	99	85	39.08517	91.66547
46	32	2728767.4	32582428.9	100	86	25.11763	52.58029
47	33	2534384.1	29853661.5	101	87	15.00619	27.46266
48	34	2354544.9	27319277.4	102	88	8.00109	12.45647
49	35	2188725.1	24964732.5	103	89	3.56699	4.45537
50	36	2034888.4	22776007.4	104	90	.88838	.88838
51	37	1891809.1	20741119.0	Difference of Age 91 years.			
52	38	1756693.9	18849309.9	91	0	12386.912	34024.5889
53	39	1629211.2	17092616.0	92	1	7129.6367	21637.6769
54	40	1508442.8	15463404.8	93	2	4494.8238	14508.0402
55	41	1393971.8	13954962.0	94	3	2965.0986	10013.2164
56	42	1285837.8	12560990.2	95	4	2037.5664	7048.1178
57	43	1184073.7	11275152.4	96	5	1445.0151	5010.5514
58	44	1088023.5	10091078.7	97	6	1057.8567	3565.5363
59	45	996167.56	9003055.16	98	7	773.97273	2507.67960
60	46	908254.30	8006887.60	99	8	574.06897	1733.70687
61	47	823649.00	7098633.30	100	9	444.38358	1159.63790
62	48	745311.36	6274984.30	101	10	327.50004	715.25432
63	49	673746.11	5529672.94	102	11	221.78898	387.75428
64	50	608675.35	4855926.83	103	12	126.12563	165.96530
65	51	549166.90	4247251.48	104	13	39.83967	39.83967
66	52	494359.04	3698084.58				
67	53	443954.78	3203725.54				

Difference of Age 91 years.

COMMUTATION TABLES FOR JOINT ANNUITIES.

Difference of Age 15 years.

AGES.		$D_{x,y}$	$N_{x,y}$	AGES.		$D_{x,y}$	$N_{x,y}$
(x)	(y)			(x)	(y)		
15	0	30304077.	346120760.	69	54	361006.22	2427892.30
16	1	24268146.	315816683.	70	55	321407.23	2066886.08
17	2	21106987.	291548537.	71	56	285090.53	1745478.85
18	3	18666943.	270441550.	72	57	250681.13	1460388.32
19	4	16984401.	251774607.	73	58	217829.45	1209707.19
20	5	15600861.	234790206.	74	59	186621.25	991877.74
21	6	14490421.	219189345.	75	60	157136.31	805256.49
22	7	13536219.	204698924.	76	61	130825.35	648120.18
23	8	12688871.	191162705.	77	62	107766.35	517294.83
24	9	11920577.	178473834.	78	63	88181.503	409528.482
25	10	11215109.	166553257.	79	64	71980.597	321346.979
26	11	10555335.	155338148.	80	65	58032.087	249366.382
27	12	9930529.9	144782813.1	81	66	46546.900	191334.295
28	13	9337259.6	134852283.2	82	67	36766.472	144787.395
29	14	8769591.7	125515023.6	83	68	28753.728	108020.923
30	15	8224219.1	116745431.9	84	69	22172.565	79267.195
31	16	7705460.9	108521212.8	85	70	16891.249	57094.630
32	17	7214911.9	100815751.9	86	71	12581.991	40203.381
33	18	6754706.6	93600840.0	87	72	9095.8829	27621.3896
34	19	6324054.7	86846133.4	88	73	6327.1439	18525.5067
35	20	5919958.1	80522078.7	89	74	4333.9583	12198.3628
36	21	5540823.2	74602120.6	90	75	2946.2270	7864.4045
37	22	5185026.3	69061297.4	91	76	1876.6172	4918.1775
38	23	4850353.4	63876271.1	92	77	1145.1573	3041.5603
39	24	4535627.8	59025917.7	93	78	700.88974	1896.40302
40	25	4238064.3	54490289.9	94	79	440.64773	1195.51328
41	26	3954622.6	50252225.6	95	80	277.47939	754.86555
42	27	3687057.6	46297603.0	96	81	177.94286	477.38616
43	28	3434129.5	42610545.4	97	82	114.88108	299.44330
44	29	3194872.5	39176415.9	98	83	73.12481	184.56222
45	30	2968248.3	35981543.4	99	84	46.46305	111.43741
46	31	2756904.1	33013295.1	100	85	30.45598	64.97436
47	32	2560320.8	30256391.0	101	86	18.60565	34.51838
48	33	2378451.1	27696070.2	102	87	10.20829	15.91272
49	34	2211175.6	25317619.1	103	88	4.57205	5.70443
50	35	2055977.3	23106443.5	104	89	1.13238	1.13238
51	36	1911984.6	21050466.2	Difference of Age 90 years.			
52	37	1775972.2	19138481.6	90	0	17589.415	48615.2091
53	38	1647609.7	17362509.4	91	1	10480.566	31025.7941
54	39	1526573.8	15714899.7	92	2	6554.9514	20545.2281
55	40	1412339.2	14188325.9	93	3	4203.0272	13990.2767
56	41	1303797.9	12775986.7	94	4	2852.5928	9787.2495
57	42	1201339.9	11472188.8	95	5	1979.0424	6934.6567
58	43	1104123.8	10270848.9	96	6	1419.2910	4955.6143
59	44	1011130.1	9166725.1	97	7	1044.8632	3536.3233
60	45	921906.39	8155594.99	98	8	767.16496	2491.46015
61	46	836036.05	7233688.60	99	9	570.29221	1724.29519
62	47	756356.66	6397652.55	100	10	442.12504	1154.00298
63	48	683267.41	5641295.89	101	11	326.02984	711.87794
64	49	617119.56	4958028.48	102	12	220.71987	385.84810
65	50	556635.97	4340908.92	103	13	125.49501	165.12823
66	51	501527.02	3784272.95	104	14	39.63322	39.63322
67	52	450807.56	3282745.93				
68	53	404046.07	2831938.37				

Difference of Age 90 years.

COMMUTATION TABLES FOR JOINT ANNUITIES.

Difference of Age 16 years.

AGES.		D _{x,y}	N _{x,y}	AGES.		D _{x,y}	N _{x,y}
(x)	(y)			(x)	(y)		
16	0	28682362.	326390305.	70	54	326931.04	2123416.18
17	1	22957477.	297707943.	71	55	290293.43	1796485.14
18	2	19962902.	274750466.	72	56	255536.32	1506191.71
19	3	17654263.	254787564.	73	57	222478.59	1250655.39
20	4	16062208.	237133301.	74	58	191250.69	1028176.80
21	5	14753055.	221071093.	75	59	161708.49	836926.11
22	6	13704550.	206318038.	76	60	135358.35	675217.62
23	7	12801471.	192613488.	77	61	111765.93	539859.27
24	8	11999521.	179812017.	78	62	91608.385	428093.341
25	9	11272400.	167812496.	79	63	74843.331	336484.956
26	10	10602933.	156540096.	80	64	60435.669	261641.625
27	11	9978630.9	145937163.3	81	65	48541.306	201205.956
28	12	9384180.5	135958532.4	82	66	38398.474	152664.650
29	13	8815274.0	126574351.9	83	67	30089.344	114266.176
30	14	8269909.2	117759077.9	84	68	23252.654	84176.832
31	15	7753458.5	109489168.7	85	69	17763.600	60924.178
32	16	7263637.7	101735710.2	86	70	13267.176	43160.578
33	17	6801735.8	94472072.5	87	71	9664.6409	29893.4016
34	18	6368394.1	87670336.7	88	72	6789.7192	20228.7607
35	19	5961757.5	81301942.6	89	73	4701.2029	13439.0415
36	20	5580223.8	75340185.1	90	74	3238.2113	8737.8386
37	21	5221291.2	69759961.3	91	75	2074.8078	5499.6273
38	22	4884516.6	64538670.1	92	76	1276.6103	3424.8195
39	23	4567800.8	59654153.5	93	77	785.25076	2148.20918
40	24	4268341.4	55086352.7	94	78	494.45485	1362.95842
41	25	3983760.5	50818011.3	95	79	314.74839	868.50357
42	26	3714425.7	46834250.8	96	80	202.60400	553.75518
43	27	3461014.7	43119825.1	97	81	132.62822	351.15118
44	28	3222907.5	39658810.4	98	82	85.09709	218.52296
45	29	2997709.8	36435902.9	99	83	54.71924	133.42587
46	30	2785040.8	33438193.1	100	84	36.20498	78.70662
47	31	2586720.6	30653152.3	101	85	22.55999	42.50165
48	32	2402792.0	28066431.7	102	86	12.65690	19.94166
49	33	2233626.2	25663639.7	103	87	5.83331	7.28476
50	34	2077066.3	23430013.5	104	88	1.45144	1.45144
51	35	1931799.7	21352947.2	Difference of Age 89 years.			
52	36	1794912.3	19421147.5	89	0	23541.327	67862.4614
53	37	1665690.9	17626235.2	90	1	14882.404	44321.1344
54	38	1543813.1	15960544.3	91	2	9635.7788	29438.7304
55	39	1429315.0	14416731.2	92	3	6129.4146	19802.9516
56	40	1320977.1	12987416.2	93	4	4043.5502	13673.5370
57	41	1218119.7	11666439.1	94	5	2770.6592	9629.9868
58	42	1120224.2	10448319.4	95	6	1943.8115	6859.3276
59	43	1026092.6	9328095.2	96	7	1401.8581	4915.5161
60	44	935753.51	8302002.65	97	8	1035.6727	3513.6580
61	45	848602.62	7366249.14	98	9	762.11783	2477.98528
62	46	767731.69	6517646.52	99	10	567.39375	1715.86745
63	47	693393.25	5749914.83	100	11	440.14027	1148.47370
64	48	625840.62	5056521.58	101	12	324.45824	708.33343
65	49	564358.24	4430680.96	102	13	219.61627	383.87519
66	50	508348.16	3866322.72	103	14	124.84467	164.25892
67	51	457344.06	3357974.56	104	15	39.41425	39.41425
68	52	410282.83	2900630.50				
69	53	366931.49	2490347.67				

Difference of Age 89 years.

COMMUTATION TABLES FOR JOINT ANNUITIES.

Difference of Age 17 years.

AGES.		D_{xy}	N_{xy}	AGES.		D_{xy}	N_{xy}
(x)	(y)			(x)	(y)		
17	0	27133291.	307695676.	71	54	295282.51	1844865.51
18	1	21713089.	280562385.	72	55	260199.85	1549583.00
19	2	18879916.	258849296.	73	56	226787.56	1289383.15
20	3	16695699.	239969380.	74	57	195332.56	1062595.59
21	4	15189330.	223273681.	75	58	165719.93	867263.03
22	5	13952939.	208084351.	76	59	139296.86	701543.10
23	6	12960664.	194131412.	77	60	115638.54	562246.24
24	7	12106004.	181170748.	78	61	95008.283	446607.705
25	8	11347051.	169064744.	79	62	77751.869	351599.422
26	9	10657097.	157717693.	80	63	62839.250	273847.553
27	10	10023629.	147060596.	81	64	50551.798	211008.303
28	11	9429635.1	137036967.1	82	65	40043.744	160456.505
29	12	8859571.8	127607332.0	83	66	31424.959	120412.761
30	13	8312988.5	118747760.2	84	67	24332.743	88987.802
31	14	7796533.2	110434771.7	85	68	18628.916	64655.059
32	15	7308883.3	102638238.5	86	69	13952.362	46026.143
33	16	6847671.3	95329355.2	87	70	10190.954	32073.781
34	17	6412733.7	88481683.9	88	71	7214.2747	21882.8271
35	18	6003556.9	82068950.2	89	72	5044.9064	14668.5524
36	19	5619624.4	76065393.3	90	73	3512.6061	9623.6460
37	20	5258419.6	70445768.9	91	74	2280.4305	6111.0399
38	21	4918679.7	65187349.3	92	75	1411.4338	3830.6094
39	22	4599973.8	60268669.6	93	76	875.38991	2419.17563
40	23	4298618.4	55668695.8	94	77	553.96880	1543.78572
41	24	4012220.8	51370077.4	95	78	353.18205	989.81692
42	25	3741793.8	47357856.6	96	79	229.81629	636.63487
43	26	3486704.9	43616062.8	97	80	151.00920	406.81858
44	27	3248139.0	40129357.9	98	81	98.24313	255.80938
45	28	3024014.7	36881218.9	99	82	63.67809	157.56626
46	29	2812683.9	33857204.2	100	83	42.63837	93.88816
47	30	2613120.4	31044520.3	101	84	26.81850	51.24979
48	31	2427567.5	28431399.9	102	85	15.34693	24.43129
49	32	2256484.9	26003832.4	103	86	7.23252	9.08436
50	33	2098155.2	23747347.5	104	87	1.85184	1.85184
51	34	1951614.9	21649192.3	Difference of Age 88 years.			
52	35	1813514.2	19697577.4	88	0	31683.244	93644.268
53	36	1683454.9	17884063.2	89	1	19918.317	61961.024
54	37	1560755.2	16200608.3	90	2	13682.806	42042.707
55	38	1445456.1	14639853.1	91	3	9010.2398	28359.9009
56	39	1336854.9	13194397.0	92	4	5896.8440	19349.6611
57	40	1234170.0	11857542.1	93	5	3927.4094	13452.8171
58	41	1135871.1	10623372.1	94	6	2721.3360	9525.4077
59	42	1041055.2	9487501.0	95	7	1919.9361	6804.0717
60	43	949600.63	8446445.81	96	8	1389.5275	4884.1356
61	44	861348.71	7496845.18	97	9	1028.8591	3494.6081
62	45	779271.57	6635496.47	98	10	758.24444	2465.74900
63	46	703821.35	5856224.90	99	11	564.84663	1707.50456
64	47	635115.42	5152403.55	100	12	438.01862	1142.65793
65	48	572333.68	4517288.13	101	13	322.83595	704.63931
66	49	515400.52	3944954.45	102	14	218.47818	381.80336
67	50	463564.28	3429553.93	103	15	124.15492	163.32518
68	51	416231.74	2965989.65	104	16	39.17026	39.17026
69	52	372595.36	2549757.91				
70	53	332297.04	2177162.55				

Difference of Age 88 years.

COMMUTATION TABLES FOR JOINT ANNUITIES.

Difference of Age 18 years.

AGES.		D _{x,y}	N _{x,y}	AGES.		D _{x,y}	N _{x,y}
(x)	(y)			(x)	(y)		
18	0	25662556.	289995343.	72	54	264671.74	1590705.88
19	1	20535155.	264332787.	73	55	230926.43	1326034.14
20	2	17854803.	243797632.	74	56	199115.76	1095107.71
21	3	15788395.	225942829.	75	57	169256.90	895991.95
22	4	14365554.	210154434.	76	58	142752.34	726735.05
23	5	13195571.	195788880.	77	59	119003.26	583982.71
24	6	12256549.	182593309.	78	60	98300.249	464979.449
25	7	11447744.	170336760.	79	61	80637.506	366679.200
26	8	10727673.	158889016.	80	62	65281.290	286041.694
27	9	10074833.	148161343.	81	63	52562.289	220760.404
28	10	9472157.2	138086510.0	82	64	41702.282	168198.115
29	11	8902485.3	128614352.8	83	65	32771.433	126495.833
30	12	8354762.2	119711867.5	84	66	25412.833	93724.400
31	13	7837146.7	111357105.3	85	67	19494.232	68311.567
32	14	7349488.2	103519958.6	86	68	14632.021	48817.335
33	15	6890325.7	96170470.4	87	69	10717.267	34185.314
34	16	6456042.1	89280144.7	88	70	7607.1469	23468.0469
35	17	6045356.3	82824102.6	89	71	5360.3601	15860.9000
36	18	5659024.9	76778746.3	90	72	3769.4116	10500.5399
37	19	5295548.0	71119721.4	91	73	2473.6663	6731.1283
38	20	4953656.3	65824173.4	92	74	1551.3132	4257.4620
39	21	4632146.8	60870517.1	93	75	967.84033	2706.14876
40	22	4328895.4	56238370.3	94	76	617.55903	1738.30843
41	23	4040681.1	51909474.9	95	77	395.69201	1120.74940
42	24	3768525.4	47868793.8	96	78	257.87896	725.05739
43	25	3512395.2	44100268.4	97	79	171.29165	467.17843
44	26	3272249.2	40587873.2	98	80	111.85866	295.88678
45	27	3047689.2	37315624.0	99	81	73.51526	184.02812
46	28	2837365.2	34267934.8	100	82	49.61930	110.51287
47	29	2639057.1	31430569.6	101	83	31.58398	60.89357
48	30	2452343.1	28791512.5	102	84	18.24388	29.30959
49	31	2279751.9	26339169.4	103	85	8.76967	11.06571
50	32	2119627.5	24059417.5	104	86	2.29604	2.29604
51	33	1971430.1	21939790.0	Difference of Age 87 years.			
52	34	1832116.1	19968359.9	87	0	42444.624	128060.977
53	35	1700901.6	18136243.8	88	1	26807.193	85616.353
54	36	1577400.1	16435342.2	89	2	18312.798	58809.160
55	37	1461318.8	14857942.1	90	3	12794.540	40496.362
56	38	1351951.8	13396623.3	91	4	8668.3610	27701.822
57	39	1249004.4	12044671.5	92	5	5727.4720	19033.461
58	40	1150837.6	10795667.1	93	6	3857.4937	13305.9893
59	41	1055596.2	9644829.5	94	7	2687.9104	9448.4956
60	42	963447.76	8589233.34	95	8	1903.0485	6760.5852
61	43	874094.81	7625785.58	96	9	1380.3859	4857.5367
62	44	790976.30	6751690.77	97	10	1023.6300	3477.1508
63	45	714400.58	5960714.47	98	11	754.84056	2453.52085
64	46	644667.06	5246313.89	99	12	562.12384	1698.68029
65	47	580815.52	4601646.83	100	13	435.82852	1136.55645
66	48	522684.11	4020831.31	101	14	321.16296	700.72793
67	49	469995.35	3498147.20	102	15	217.27112	379.56497
68	50	421892.80	3028151.85	103	16	123.38635	162.29385
69	51	377997.82	2606259.05	104	17	38.90750	38.90750
70	52	337426.30	2228261.23				
71	53	300129.05	1890834.93				

Difference of Age 87 years.

COMMUTATION TABLES FOR JOINT ANNUITIES.

Difference of Age 19 years.

AGES.		D_{xy}	N_{xy}	AGES.		D_{xy}	N_{xy}
(x)	(y)			(x)	(y)		
19	0	24270364.	273241116.	73	54	234895.21	1360740.05
20	1	19420169.	248970752.	74	55	202749.63	1125844.84
21	2	16884510.	229550583.	75	56	172535.06	923095.21
22	3	14932129.	212666073.	76	57	145799.12	750560.15
23	4	13585789.	197733944.	77	58	121955.33	604761.03
24	5	12478695.	184148155.	78	59	101160.48	482805.70
25	6	11590103.	171669460.	79	60	83431.535	381645.220
26	7	10822870.	160079357.	80	61	67704.101	298213.685
27	8	10141554.	149256487.	81	62	54604.950	230509.584
28	9	9520544.3	139114932.6	82	63	43360.820	175904.634
29	10	8942630.3	129504388.3	83	64	34128.765	132543.814
30	11	8395230.5	120651758.0	84	65	26501.703	98415.049
31	12	7876529.3	112256527.5	85	66	20359.548	71913.346
32	13	7387772.8	104379998.2	86	67	15311.681	51553.798
33	14	6928605.3	96992225.4	87	68	11239.336	36242.117
34	15	6496257.0	90063620.1	88	69	8000.0191	25002.7806
35	16	6086183.5	83567363.1	89	70	5652.2726	17002.7615
36	17	5698425.5	77481179.6	90	71	4005.1098	11350.4889
37	18	5332676.5	71782754.1	91	72	2654.5152	7345.3791
38	19	4988632.9	66450077.6	92	73	1682.7661	4690.8639
39	20	4665085.9	61461444.7	93	74	1063.7576	3008.0978
40	21	4359172.5	56796358.8	94	75	682.77978	1944.34019
41	22	4069141.4	52437186.3	95	76	441.11361	1261.56041
42	23	3795257.1	48368044.9	96	77	288.91797	820.44680
43	24	3537488.0	44572787.8	97	78	192.20793	531.52883
44	25	3296359.3	41035299.8	98	79	126.88270	339.32090
45	26	3070311.4	37738940.5	99	80	83.70375	212.43820
46	27	2859578.4	34668629.1	100	81	57.28462	128.73445
47	28	2662214.9	31809050.7	101	82	36.75503	71.44983
48	29	2476684.0	29146835.8	102	83	21.48570	34.69479
49	30	2303018.8	26670151.8	103	84	10.42507	13.20909
50	31	2141483.3	24367133.0	104	85	2.78402	2.78402
51	32	1991605.6	22225649.7	Difference of Age 86 years.			
52	33	1850717.9	20234044.1	86	0	55256.878	172491.509
53	34	1718348.4	18383326.2	87	1	35912.396	117234.631
54	35	1593747.8	16664977.8	88	2	24646.395	81322.235
55	36	1476903.2	15071230.0	89	3	17123.961	56675.840
56	37	1366788.3	13594326.8	90	4	12309.072	39551.879
57	38	1263109.2	12227538.5	91	5	8419.384	27242.807
58	39	1164670.4	10964429.3	92	6	5625.5117	18823.4228
59	40	1069505.0	9799758.9	93	7	3810.1129	13197.9111
60	41	976904.82	8730253.95	94	8	2664.2678	9387.7982
61	42	886840.90	7753349.13	95	9	1890.5285	6723.5304
62	43	802681.05	6866508.23	96	10	1373.3702	4833.0019
63	44	725130.95	6063827.18	97	11	1019.0348	3459.6317
64	45	654357.14	5338696.23	98	12	751.20192	2440.59694
65	46	589550.53	4684339.09	99	13	559.31321	1689.39502
66	47	530430.15	4094788.56	100	14	433.56999	1130.08181
67	48	476637.28	3564358.41	101	15	319.38858	696.51182
68	49	427745.76	3087721.13	102	16	215.92612	377.12324
69	50	383138.87	2659975.37	103	17	122.55864	161.49712
70	51	342318.82	2276836.50	104	18	38.63848	38.63848
71	52	304761.77	1934517.68				
72	53	269015.86	1629755.91				

Difference of Age 86 years.

COMMUTATION TABLES FOR JOINT ANNUITIES.

Difference of Age 20 years.

AGES.		D _{xy}	N _{xy}	AGES.		D _{xy}	N _{xy}
(x)	(y)			(x)	(y)		
20	0	22952569.	257383033.	74	54	206234.15	1154924.18
21	1	18364808.	234430464.	75	55	175683.83	948690.03
22	2	15968797.	216065656.	76	56	148622.95	773006.20
23	3	14121610.	200096859.	77	57	124558.22	624383.25
24	4	12847713.	185975249.	78	58	103669.93	499825.03
25	5	11800170.	173127536.	79	59	85859.133	396155.104
26	6	10957458.	161327366.	80	60	70049.997	310295.971
27	7	10231549.	150369908.	81	61	56631.525	240245.974
28	8	9583594.3	140138359.4	82	62	45045.895	183614.449
29	9	8988312.4	130554765.1	83	63	35486.098	138568.554
30	10	8433088.1	121566452.7	84	64	27599.355	103082.456
31	11	7914681.2	113133364.6	85	65	21231.899	75483.101
32	12	7424897.3	105218683.4	86	66	15991.340	54251.202
33	13	6964697.4	97793786.1	87	67	11761.405	38259.862
34	14	6532347.4	90829088.7	88	68	8389.723	26498.457
35	15	6124094.6	84296741.3	89	69	5944.1851	18108.7343
36	16	5736909.8	78172646.7	90	70	4223.2185	12164.5492
37	17	5369804.9	72435736.9	91	71	2820.4998	7941.3307
38	18	5023609.4	67065932.0	92	72	1805.7926	5120.8309
39	19	4698024.9	62042322.6	93	73	1153.8968	3315.0383
40	20	4390170.4	57344297.7	94	74	750.44632	2161.14148
41	21	4097601.6	52954127.3	95	75	487.69987	1410.69516
42	22	3821988.7	48856525.7	96	76	322.08295	922.99529
43	23	3562580.8	45034537.0	97	77	215.34260	600.91234
44	24	3319908.7	41471956.2	98	78	142.37624	385.56974
45	25	3092933.7	38152047.5	99	79	94.94623	243.19350
46	26	2880804.4	35059113.8	100	80	65.22371	148.24727
47	27	2683056.8	32178309.4	101	81	42.43305	83.02356
48	28	2498416.9	29495252.6	102	82	25.00342	40.59051
49	29	2325877.6	26996835.7	103	83	12.27754	15.58709
50	30	2163339.1	24670958.1	104	84	3.30955	3.30955
51	31	2012141.3	22507619.0	Difference of Age 85 years.			
52	32	1869658.0	20495477.7	85	0	70350.891	228536.055
53	33	1735795.2	18625819.7	86	1	46752.844	158185.164
54	34	1610095.4	16890024.5	87	2	33017.673	111432.320
55	35	1492209.4	15279929.1	88	3	23046.392	78414.647
56	36	1381364.7	13787719.7	89	4	16474.221	55368.255
57	37	1276970.8	12406355.0	90	5	11955.525	38894.034
58	38	1177822.8	11129384.2	91	6	8269.5024	26938.5090
59	39	1082360.2	9951561.4	92	7	5556.4146	18669.0066
60	40	989776.79	8869201.17	93	8	3776.5996	13112.5920
61	41	899227.95	7879424.38	94	9	2646.7398	9335.9924
62	42	814385.78	6980196.43	95	10	1880.9201	6689.2526
63	43	735861.33	6165810.65	96	11	1367.2049	4808.3325
64	44	664185.65	5429949.32	97	12	1014.1226	3441.1276
65	45	598412.15	4765763.67	98	13	747.44591	2427.00501
66	46	538407.41	4167851.52	99	14	556.41477	1679.55910
67	47	483700.91	3628944.11	100	15	431.17458	1123.14433
68	48	433790.62	3145243.20	101	16	317.41142	691.96975
69	49	388454.19	2711452.58	102	17	214.47764	374.55833
70	50	346974.61	2322998.39	103	18	121.71123	160.08069
71	51	309180.68	1976023.78	104	19	38.36946	38.36946
72	52	273168.32	1666843.10				
73	53	238750.60	1393674.78				

Difference of Age 85 years.

COMMUTATION TABLES FOR JOINT ANNUITIES.

Difference of Age 21 years.

AGES.		$D_{x,y}$	$N_{x,y}$	AGES.		$D_{x,y}$	$N_{x,y}$
(x)	(y)			(x)	(y)		
21	0	21705245.	242373781.	75	54	178703.19	972881.08
22	1	17368813.	220668536.	76	55	151335.32	794177.89
23	2	15102008.	203299723.	77	56	126970.67	642842.57
24	3	13354424.	188197715.	78	57	105882.56	515871.90
25	4	12149123.	174843291.	79	58	87989.008	409989.339
26	5	11156058.	162694168.	80	59	72088.235	322000.331
27	6	10358784.	151538110.	81	60	58593.764	249912.096
28	7	9668638.4	141179325.6	82	61	46717.701	191318.332
29	8	9047837.6	131510687.2	83	62	36865.147	144600.631
30	9	8476167.3	122462849.6	84	63	28697.007	107735.484
31	10	7950371.8	113986682.3	85	64	22111.285	79038.477
32	11	7460861.6	106036310.5	86	65	16676.526	56927.192
33	12	6999696.0	98575448.9	87	66	12283.474	40250.666
34	13	6566375.3	91575752.9	88	67	8779.4269	27967.1923
35	14	6158117.4	85009377.6	89	68	6233.7434	19187.7654
36	15	5772645.3	78851260.2	90	69	4441.3272	12954.0220
37	16	5406069.8	73078614.9	91	70	2974.0976	8512.6948
38	17	5058586.0	67672545.1	92	71	1918.7073	5538.5972
39	18	4730963.9	62613959.1	93	72	1238.2578	3619.8899
40	19	4421168.3	57882995.2	94	73	814.03655	2381.63214
41	20	4126739.5	53461826.9	95	74	536.03310	1567.59559
42	21	3848720.4	49335087.4	96	75	356.09832	1031.56249
43	22	3587673.6	45486367.0	97	76	240.06184	675.46417
44	23	3343458.1	41898693.4	98	77	159.51303	435.40233
45	24	3115029.8	38555235.3	99	78	106.54004	275.88930
46	25	2902030.3	35440205.5	100	79	73.98408	169.34926
47	26	2702972.5	32538175.2	101	80	48.31386	95.36518
48	27	2517976.5	29835202.7	102	81	28.86602	47.05132
49	28	2346287.2	27317226.2	103	82	14.28767	18.18530
50	29	2184811.4	24970939.0	104	83	3.89763	3.89763
51	30	2032677.0	22786127.6	Difference of Age 84 years.			
52	31	1888936.4	20753450.6	84	0	87812.138	297825.553
53	32	1753559.1	18864514.2	85	1	59523.889	210013.415
54	33	1626443.1	17110955.1	86	2	42984.325	150489.526
55	34	1507515.5	15484512.0	87	3	30874.219	107505.201
56	35	1395680.7	13976996.5	88	4	22171.934	76630.982
57	36	1290589.2	12581315.8	89	5	16001.040	54459.048
58	37	1190748.5	11290726.6	90	6	11742.693	38458.008
59	38	1094583.1	10099978.1	91	7	8167.9298	26715.3150
60	39	1001673.6	9005395.0	92	8	5507.5411	18547.3852
61	40	911076.43	8003721.41	93	9	3751.7536	13039.8441
62	41	825760.80	7092644.98	94	10	2633.2880	9288.0905
63	42	746591.69	6266884.18	95	11	1872.4763	6654.8025
64	43	674014.16	5520292.49	96	12	1360.6145	4782.3262
65	44	607400.36	4846278.33	97	13	1009.0520	3421.7117
66	45	546500.29	4238877.97	98	14	743.57253	2412.65967
67	46	490975.40	3692377.68	99	15	553.34065	1669.08714
68	47	440219.28	3201402.28	100	16	428.50540	1115.74649
69	48	393943.79	2761183.00	101	17	315.28216	687.24109
70	49	351788.22	2367239.21	102	18	212.99467	371.95893
71	50	313385.76	2015450.99	103	19	120.86382	158.96426
72	51	277129.13	1702065.23	104	20	38.10044	38.10044
73	52	242435.90	1424936.10				
74	53	209619.12	1182500.20				

Difference of Age 84 years.

COMMUTATION TABLES FOR JOINT ANNUITIES.

Difference of Age 22 years.

AGES.		D_{xy}	N_{xy}	AGES.		D_{xy}	N_{xy}
(x)	(y)			(x)	(y)		
22	0	20528085.	228168729.	76	54	153936.22	814166.61
23	1	16426031.	207640644.	77	55	129287.88	660230.39
24	2	14281560.	191214613.	78	56	107933.30	530942.51
25	3	12628282.	176933053.	79	57	89866.962	423009.211
26	4	11485964.	164304771.	80	58	73876.500	333142.249
27	5	10546533.	152818807.	81	59	60298.660	259265.749
28	6	9788873.3	142272273.7	82	60	48336.435	198967.089
29	7	9128127.5	132483400.4	83	61	38233.338	150630.654
30	8	8532300.9	123355272.9	84	62	29812.221	112397.316
31	9	7990985.1	114822972.0	85	63	22990.671	82585.095
32	10	7494505.7	106831986.9	86	64	17367.237	59594.424
33	11	7033600.8	99337481.2	87	65	12809.787	42227.187
34	12	6599372.2	92303880.4	88	66	9169.1308	29417.4004
35	13	6190195.9	85704508.2	89	67	6523.3017	20248.2696
36	14	5804715.5	79514312.3	90	68	4657.6771	13724.9679
37	15	5439744.4	73709596.8	91	69	3127.6953	9067.2908
38	16	5092749.1	68269852.4	92	70	2023.1956	5939.5955
39	17	4763902.9	63177103.3	93	71	1315.6850	3916.3999
40	18	4452166.2	58413200.4	94	72	873.55049	2600.71487
41	19	4155877.4	53961034.2	95	73	581.45471	1727.16438
42	20	3876088.5	49805156.8	96	74	391.38926	1145.70967
43	21	3612766.4	45929068.3	97	75	265.41491	754.32041
44	22	3367007.6	42316301.9	98	76	177.82358	488.90550
45	23	3137126.0	38949294.3	99	77	119.36348	311.08192
46	24	2922762.6	35812168.3	100	78	83.01821	191.71844
47	25	2722888.2	32889405.7	101	79	54.80303	108.70023
48	26	2536666.8	30166517.5	102	80	32.86657	53.89720
49	27	2364655.8	27629850.7	103	81	16.49487	21.03063
50	28	2203983.2	25265194.9	104	82	4.53577	4.53577
51	29	2052852.5	23061211.7	Difference of Age 83 years.			
52	30	1908214.7	21008359.2	83	0	108586.59	382896.852
53	31	1771640.3	19100144.5	84	1	74297.850	274310.262
54	32	1643088.0	17328504.2	85	2	54725.958	200012.412
55	33	1522821.6	15685416.2	86	3	40193.853	145286.454
56	34	1409996.7	14162594.6	87	4	29702.748	105092.601
57	35	1303964.4	12752597.9	88	5	21535.101	75389.853
58	36	1203447.4	11448633.5	89	6	15716.190	53854.752
59	37	1106595.3	10245186.1	90	7	11598.460	38138.562
60	38	1012985.3	9138590.8	91	8	8096.0856	26540.1020
61	39	922027.29	8125605.53	92	9	5471.3073	18444.0164
62	40	836641.26	7203578.24	93	10	3732.6857	12972.7091
63	41	757019.79	6366936.98	94	11	2621.4667	9240.0234
64	42	683842.67	5609917.19	95	12	1863.4502	6618.5567
65	43	616388.57	4926074.52	96	13	1353.8114	4755.1065
66	44	554708.77	4309685.95	97	14	1003.8229	3401.2951
67	45	498355.32	3754977.18	98	15	739.46439	2397.47225
68	46	446839.84	3256621.86	99	16	549.91521	1658.00786
69	47	399781.93	2809782.02	100	17	425.63090	1108.09265
70	48	356759.65	2410000.09	101	18	313.10220	682.46175
71	49	317733.39	2053240.44	102	19	211.51171	369.35955
72	50	280898.30	1735507.05	103	20	120.01642	157.84784
73	51	245951.10	1454608.75	104	21	37.83142	37.83142
74	52	212854.75	1208657.65				
75	53	181636.29	995802.90				

Difference of Age 83 years.

COMMUTATION TABLES FOR JOINT ANNUITIES.

Difference of Age 23 years.

AGES.		D_{xy}	N_{xy}	AGES.		D_{xy}	N_{xy}
(x)	(y)			(x)	(y)		
23	0	19413817.	214721531.	77	54	131509.87	676628.06
24	1	15533652.	195307714.	78	55	109903.08	545118.19
25	2	13505005.	179774062.	79	56	91607.504	435215.109
26	3	11938968.	166269057.	80	57	75453.250	343907.605
27	4	10858414.	154330089.	81	58	61794.467	268154.355
28	5	9966292.8	143471675.0	82	59	49742.875	206359.888
29	6	9241640.9	133505382.2	83	60	39558.094	156617.013
30	7	8608015.9	124263741.3	84	61	30918.654	117058.919
31	8	8043905.4	115655725.4	85	62	23884.127	86140.265
32	9	7532790.3	107611820.0	86	63	18057.948	62256.138
33	10	7065318.1	100079029.7	87	64	13340.345	44198.190
34	11	6631338.0	93013711.6	88	65	9562.003	30857.845
35	12	6221302.5	86382373.6	89	66	6812.860	21295.842
36	13	5834953.2	80161071.1	90	67	4874.0268	14482.9821
37	14	5469965.2	74326117.9	91	68	3280.0542	9608.9553
38	15	5124472.0	68856152.7	92	69	2127.6838	6328.9011
39	16	4796075.9	63731680.7	93	70	1387.3341	4201.2173
40	17	4483164.2	58935604.8	94	71	928.17287	2813.88317
41	18	4185015.3	54452440.6	95	72	623.96466	1885.71030
42	19	3903456.6	50267425.3	96	73	424.55423	1261.74564
43	20	3638456.7	46363968.7	97	74	291.71872	837.19141
44	21	3390557.0	42725512.0	98	75	196.60363	545.47269
45	22	3159222.1	39334955.0	99	76	133.06525	348.86906
46	23	2943494.9	36175732.9	100	77	93.01051	215.80381
47	24	2742340.7	33232238.0	101	78	61.49498	122.79330
48	25	2555357.1	30489897.3	102	79	37.28097	61.29832
49	26	2382208.0	27934540.2	103	80	18.78089	24.01735
50	27	2221237.7	25552332.2	104	81	5.23646	5.23646
51	28	2070866.3	23331094.5	Difference of Age 82 years.			
52	29	1927154.8	21260228.2	82	0	132683.05	486121.941
53	30	1789721.6	19333073.4	83	1	91875.115	353438.891
54	31	1660030.1	17543351.8	84	2	68309.062	261563.776
55	32	1538406.1	15883321.7	85	3	51173.238	193254.714
56	33	1424312.7	14344915.6	86	4	38668.763	142081.476
57	34	1317339.7	12920602.9	87	5	28849.611	103412.713
58	35	1215919.5	11603263.2	88	6	21151.734	74563.102
59	36	1118396.7	10387343.7	89	7	15523.151	53411.368
60	37	1024102.1	9268947.0	90	8	11496.441	37888.217
61	38	932439.6	8244844.9	91	9	8042.822	26391.776
62	39	846697.43	7312405.29	92	10	5443.4999	18348.9544
63	40	766994.49	6465707.86	93	11	3715.9290	12905.4545
64	41	693394.32	5698713.37	94	12	2608.8302	9189.5255
65	42	625376.78	5005319.05	95	13	1854.1330	6580.6953
66	43	562917.26	4379942.27	96	14	1346.7957	4726.5623
67	44	505840.67	3817025.01	97	15	998.27696	3379.76665
68	45	453556.35	3311184.34	98	16	734.88676	2381.48969
69	46	405794.34	2857627.99	99	17	546.22628	1646.60293
70	47	362046.74	2451833.65	100	18	422.68797	1100.37665
71	48	322223.57	2089786.91	101	19	310.92225	677.68868
72	49	284795.22	1767563.34	102	20	210.02875	366.76643
73	50	249296.22	1482768.12	103	21	119.16902	156.73768
74	51	215941.05	1233471.90	104	22	37.56866	37.56866
75	52	184439.98	1017530.85				
76	53	156462.81	833090.87				

Difference of Age 82 years.

COMMUTATION TABLES FOR JOINT ANNUITIES.

Difference of Age 24 years.

AGES.		D _{xy}	N _{xy}	AGES.		D _{xy}	N _{xy}
(x)	(y)			(x)	(y)		
24	0	18359121.	201991659.	78	54	111791.91	558470.83
25	1	14689015.	183632538.	79	55	93279.341	446678.922
26	2	12767835.	168943523.	80	56	76914.628	353399.581
27	3	11286668.	156175688.	81	57	63113.350	276484.953
28	4	10261015.	144889020.	82	58	50976.828	213371.603
29	5	9409142.2	134628004.9	83	59	40709.112	162394.775
30	6	8715061.4	125218862.7	84	60	31989.962	121685.663
31	7	8115286.5	116503801.3	85	61	24770.549	89695.701
32	8	7582676.3	108388514.8	86	62	18759.710	64925.152
33	9	7101410.3	100805838.5	87	63	13870.903	46165.442
34	10	6661241.3	93704428.2	88	64	9958.0436	32294.5386
35	11	6251436.9	87043186.9	89	65	7104.7725	22336.4950
36	12	5864274.6	80791750.0	90	66	5090.3767	15231.7225
37	13	5498459.1	74927475.4	91	67	3432.4133	10141.3458
38	14	5152941.3	69429016.3	92	68	2231.3294	6708.9325
39	15	4825950.9	64276075.0	93	69	1458.9832	4477.6031
40	16	4513441.2	59450124.1	94	70	978.71896	3018.61990
41	17	4214153.2	54936682.9	95	71	662.98066	2039.90094
42	18	3930824.7	50722529.7	96	72	455.59325	1376.92028
43	19	3664146.9	46791705.0	97	73	316.43795	921.32703
44	20	3414667.1	43127558.1	98	74	216.08793	604.88908
45	21	3181318.2	39712891.0	99	75	147.11835	388.80115
46	22	2964227.2	36531572.8	100	76	103.68721	241.68280
47	23	2761793.2	33567345.6	101	77	68.89668	137.99559
48	24	2573612.8	30805552.4	102	78	41.83331	69.09891
49	25	2399760.3	28231939.6	103	79	21.30341	27.26560
50	26	2237725.4	25832179.3	104	80	5.96219	5.96219
51	27	2087078.7	23594453.9	Difference of Age 81 years.			
52	28	1944065.6	21507375.2	81	0	160839.32	610527.415
53	29	1807485.5	19563309.6	82	1	112263.13	449688.095
54	30	1676972.2	17755824.1	83	2	84469.508	337424.965
55	31	1554268.8	16078851.9	84	3	63874.549	252955.457
56	32	1438889.0	14524583.1	85	4	49231.553	189080.908
57	33	1330714.9	13085694.1	86	5	37558.100	139849.355
58	34	1228391.6	11754979.2	87	6	28336.031	102291.255
59	35	1129987.4	10526587.6	88	7	20891.931	73955.224
60	36	1035023.7	9396600.2	89	8	15386.611	53063.293
61	37	942672.38	8361576.46	90	9	11420.807	37676.682
62	38	856259.05	7418904.08	91	10	8001.9452	26255.8748
63	39	776213.54	6562645.03	92	11	5419.0632	18253.9296
64	40	702530.68	5786431.49	93	12	3698.0168	12834.8664
65	41	634111.80	5083900.81	94	13	2595.7861	9136.8496
66	42	571125.75	4449789.01	95	14	1844.5246	6541.0635
67	43	513326.01	3878663.26	96	15	1339.3549	4696.5389
68	44	460368.81	3365337.25	97	16	992.09715	3357.18397
69	45	411893.89	2904968.44	98	17	729.95699	2365.08682
70	46	367491.64	2493074.55	99	18	542.44950	1635.12983
71	47	326998.84	2125582.91	100	19	419.74503	1092.68033
72	48	288819.92	1798584.07	101	20	308.74229	672.93530
73	49	252754.73	1509764.15	102	21	208.54579	364.19301
74	50	218878.00	1257009.42	103	22	118.34132	155.64722
75	51	187114.28	1038131.42	104	23	37.30590	37.30590
76	52	158877.94	851017.14				
77	53	133668.37	692139.20				

Difference of Age 81 years.

COMMUTATION TABLES FOR JOINT ANNUITIES.

Difference of Age 25 years.

AGES.		$D_{x,y}$	$N_{x,y}$	AGES.		$D_{x,y}$	$N_{x,y}$
(x)	(y)			(x)	(y)		
25	0	17360850.	189940475.	79	54	94882.473	457464.304
26	1	13887216.	172579625.	80	55	78318.320	362581.831
27	2	12070249.	158692409.	81	56	64335.728	284263.511
28	3	10665708.	146622160.	82	57	52064.828	219927.783
29	4	9687388.1	135956452.3	83	58	41718.967	167862.955
30	5	8873018.5	126269064.2	84	59	32920.771	126143.988
31	6	8216204.5	117396045.7	85	60	25628.830	93223.217
32	7	7649964.5	109179841.2	86	61	19455.947	67594.387
33	8	7148439.5	101529876.7	87	62	14409.950	48138.440
34	9	6695269.4	94381437.2	88	63	10354.084	33728.490
35	10	6279627.2	87686167.8	89	64	7399.0391	23374.4062
36	11	5892679.6	81406540.6	90	65	5308.4854	15975.3671
37	12	5526089.6	75513861.0	91	66	3584.7724	10666.8817
38	13	5179783.8	69987771.4	92	67	2334.9750	7082.1093
39	14	4852761.7	64807987.6	93	68	1530.0544	4747.1343
40	15	4541555.6	59955225.9	94	69	1029.2650	3217.0799
41	16	4242613.5	55413670.3	95	70	699.0850	2187.8149
42	17	3958192.8	51171056.8	96	71	484.08111	1488.72991
43	18	3689837.2	47212864.0	97	72	339.57263	1004.64880
44	19	3438777.3	43523026.8	98	73	234.39848	665.07617
45	20	3203940.5	40084249.5	99	74	161.69843	430.67769
46	21	2984959.6	36880309.0	100	75	114.63769	268.97926
47	22	2781245.7	33895349.4	101	76	76.80535	154.34157
48	23	2591868.5	31114103.7	102	77	46.86848	77.53622
49	24	2416904.4	28522235.2	103	78	23.90475	30.66774
50	25	2254213.1	26105330.8	104	79	6.76299	6.76299
51	26	2102570.6	23851117.7	Difference of Age 80 years.			
52	27	1959285.3	21748547.1	80	0	192286.57	758195.24
53	28	1823346.2	19789261.8	81	1	136086.15	565908.67
54	29	1693617.1	17965915.6	82	2	103214.14	429822.52
55	30	1570131.5	16272298.5	83	3	78985.886	326608.378
56	31	1453725.6	14702167.0	84	4	61450.934	247622.492
57	32	1344333.4	13248441.4	85	5	47817.501	186171.558
58	33	1240863.8	11904108.0	86	6	36889.492	138354.057
59	34	1141578.1	10663244.2	87	7	27987.985	101464.565
60	35	1045750.4	9521666.1	88	8	20708.168	73476.580
61	36	952725.64	8475915.67	89	9	15285.384	52768.412
62	37	865655.81	7523190.03	90	10	11362.762	37483.028
63	38	784979.19	6657534.22	91	11	7966.0231	26120.2657
64	39	710974.89	5872555.03	92	12	5392.9411	18154.2426
65	40	642467.03	5161580.14	93	13	3679.5267	12761.3015
66	41	579103.01	4519113.11	94	14	2582.3343	9081.7748
67	42	520811.36	3940010.10	95	15	1834.3338	6499.4405
68	43	467181.27	3419198.74	96	16	1331.0636	4665.1067
69	44	418080.58	2952017.47	97	17	985.44197	3334.04308
70	45	373015.46	2533936.89	98	18	724.90985	2348.60111
71	46	331916.65	2160921.43	99	19	538.67274	1623.69126
72	47	293100.15	1829004.78	100	20	416.80210	1085.01852
73	48	256326.63	1535904.63	101	21	306.56234	668.21642
74	49	221914.52	1279578.00	102	22	207.09732	361.65408
75	50	189659.17	1057663.48	103	23	117.51362	154.55676
76	51	161181.59	868004.31	104	24	37.04314	37.04314
77	52	135731.64	706822.72				
78	53	113626.78	571091.08				

Difference of Age 80 years.

COMMUTATION TABLES FOR JOINT ANNUITIES.

Difference of Age 26 years.

AGES.		D _{x,y}	N _{x,y}	AGES.		D _{x,y}	N _{x,y}
(x)	(y)			(x)	(y)		
26	0	16413209.	178530824.	80	54	79664.326	371210.132
27	1	13128471.	162117615.	81	55	65509.855	291545.806
28	2	11406178.	148989144.	82	56	53073.220	226035.951
29	3	10069457.	137582966.	83	57	42609.378	172962.731
30	4	9135410.3	127513509.2	84	58	33737.423	130353.353
31	5	8365120.3	118378098.9	85	59	26374.549	96615.930
32	6	7745095.9	110012978.6	86	60	20130.081	70241.381
33	7	7211874.2	102267882.7	87	61	14944.752	50111.300
34	8	6739608.8	95056008.5	88	62	10756.461	35166.548
35	9	6311705.8	88316399.7	89	63	7693.3057	24410.0872
36	10	5919252.1	82004693.9	90	64	5528.3531	16716.7815
37	11	5552856.6	76085441.8	91	65	3738.3700	11188.4284
38	12	5205812.9	70532585.2	92	66	2438.6206	7450.0584
39	13	4878040.5	65326772.3	93	67	1601.1257	5011.4378
40	14	4566786.5	60448731.8	94	68	1079.4035	3410.3121
41	15	4269040.9	55881945.3	95	69	735.18935	2330.90859
42	16	3984924.5	51612904.4	96	70	510.44302	1595.71924
43	17	3715527.4	47627979.9	97	71	360.80582	1085.27622
44	18	3462887.4	43912452.5	98	72	251.53527	724.47040
45	19	3226562.7	40449565.1	99	73	175.40020	472.93513
46	20	3006185.5	37223002.4	100	74	125.99880	297.53493
47	21	2800698.2	34216816.9	101	75	84.91680	171.53613
48	22	2610124.1	31416118.7	102	76	52.24853	86.61933
49	23	2434048.4	28805994.6	103	77	26.78199	34.37080
50	24	2270317.4	26371946.2	104	78	7.58881	7.58881
51	25	2118062.4	24101628.8	Difference of Age 79 years.			
52	26	1973828.6	21983566.4	79	0	229018.76	933231.65
53	27	1837620.9	20009737.8	80	1	162693.67	704212.89
54	28	1708478.6	18172116.9	81	2	125116.91	541519.22
55	29	1585716.0	16463638.3	82	3	96513.65	416402.31
56	30	1468562.2	14877922.3	83	4	75988.895	319888.664
57	31	1358195.0	13409360.1	84	5	59685.910	243899.769
58	32	1253562.7	12051165.1	85	6	46966.255	184213.859
59	33	1153168.8	10797602.4	86	7	36436.385	137247.604
60	34	1056477.0	9644433.6	87	8	27741.806	100811.219
61	35	962599.37	8587956.60	88	9	20571.930	73069.413
62	36	874887.72	7625357.23	89	10	15207.697	52497.483
63	37	793593.71	6750469.51	90	11	11311.753	37289.786
64	38	719003.81	5956875.80	91	12	7927.6237	25978.0335
65	39	650189.30	5237871.99	92	13	5365.9764	18050.4098
66	40	586733.43	4587682.69	93	14	3660.4588	12684.4334
67	41	528085.85	4000949.26	94	15	2568.0672	9023.9746
68	42	473993.73	3472863.41	95	16	1822.9784	6455.9074
69	43	424267.26	2998869.68	96	17	1322.1346	4632.9290
70	44	378618.19	2574602.42	97	18	978.62834	3310.79441
71	45	336905.73	2195984.23	98	19	719.86272	2332.16607
72	46	297508.16	1859078.50	99	20	534.89597	1612.30335
73	47	260125.33	1561570.34	100	21	413.85916	1077.40738
74	48	225050.59	1301445.01	101	22	304.43308	663.54822
75	49	192290.33	1076394.42	102	23	205.64884	359.11514
76	50	163373.78	884104.09	103	24	116.68592	153.46630
77	51	137699.69	720730.31	104	25	36.78038	36.78038
78	52	115380.69	583030.62				
79	53	96439.80	467649.93				

Difference of Age 79 years.

COMMUTATION TABLES FOR JOINT ANNUITIES.

Difference of Age 27 years.

AGES.		D _{x,y}	N _{x,y}	AGES.		D _{x,y}	N _{x,y}
(x)	(y)			(x)	(y)		
27	0	15516453.	167730313.	81	54	66635.730	298380.954
28	1	12406180.	152213860.	82	55	54041.806	231745.224
29	2	10768533.	139807680.	83	56	43434.636	177703.418
30	3	9495709.4	129039147.2	84	57	34457.483	134268.782
31	4	8612492.5	119543437.8	85	58	27028.812	99811.299
32	5	7885472.9	110930945.3	86	59	20715.804	72782.487
33	6	7301557.9	103045472.4	87	60	15462.576	52066.683
34	7	6799415.6	95743914.5	88	61	11155.670	36604.107
35	8	6353505.1	88944498.9	89	62	7992.2805	25448.4375
36	9	5949489.8	82590993.8	90	63	5748.2208	17456.1570
37	10	5577896.7	76641504.0	91	64	3893.2064	11707.9362
38	11	5231028.5	71063607.3	92	65	2543.1088	7814.7298
39	12	4902553.3	65832578.8	93	66	1672.1970	5271.6210
40	13	4590575.5	60930025.5	94	67	1129.5419	3599.4240
41	14	4292757.8	56339450.0	95	68	771.00253	2469.88209
42	15	4009746.7	52046692.2	96	69	536.80492	1698.87956
43	16	3740620.2	48036945.5	97	70	380.45444	1162.07464
44	17	3486997.5	44296325.3	98	71	267.26356	781.62020
45	18	3249184.9	40809327.8	99	72	188.22365	514.35664
46	19	3027411.4	37560142.9	100	73	136.67550	326.13299
47	20	2820613.9	34532731.5	101	74	93.33244	189.45749
48	21	2628379.8	31712117.6	102	75	57.76653	96.12505
49	22	2451192.5	29083737.8	103	76	29.85630	38.35852
50	23	2286421.6	26632545.3	104	77	8.50222	8.50222
51	24	2133194.0	24346123.7	Difference of Age 78 years.			
52	25	1988371.9	22212929.7	78	0	269833.24	1138220.04
53	26	1851261.1	20224557.8	79	1	193772.77	868386.80
54	27	1721854.0	18373296.7	80	2	149579.72	674614.03
55	28	1599630.6	16651442.7	81	3	116994.52	525034.31
56	29	1483138.5	15051812.1	82	4	92851.597	408039.790
57	30	1372056.6	13568673.6	83	5	73806.305	315188.193
58	31	1266488.3	12196617.0	84	6	58623.383	241381.888
59	32	1164970.2	10930128.7	85	7	46389.377	182758.505
60	33	1067203.7	9765158.5	86	8	36115.895	136369.128
61	34	972473.11	8697954.85	87	9	27559.294	100253.233
62	35	883954.77	7725481.74	88	10	20467.376	72693.939
63	36	802057.10	6841526.97	89	11	15139.427	52226.563
64	37	726894.30	6039469.87	90	12	11257.226	37087.136
65	38	657531.78	5312575.57	91	13	7887.9856	25829.9101
66	39	593785.79	4655043.79	92	14	5338.1691	17941.9245
67	40	535044.06	4061258.00	93	15	3640.2353	12603.7554
68	41	480614.29	3526213.94	94	16	2552.1697	8963.5201
69	42	430453.95	3045599.65	95	17	1810.7495	6411.3504
70	43	384220.92	2615145.70	96	18	1312.9930	4600.6009
71	44	341966.09	2230924.78	97	19	971.8147	3287.6079
72	45	301980.04	1888958.69	98	20	714.81558	2315.79320
73	46	264037.41	1586978.65	99	21	531.11919	1600.97762
74	47	228385.78	1322941.24	100	22	410.98466	1069.85843
75	48	195007.76	1094555.46	101	23	302.30383	658.87377
76	49	165640.28	899547.70	102	24	204.20037	356.56994
77	50	139572.51	733907.42	103	25	115.85821	152.36957
78	51	117053.66	594334.91	104	26	36.51136	36.51136
79	52	97928.421	477281.250				
80	53	80971.875	379352.829				

Difference of Age 78 years.

COMMUTATION TABLES FOR JOINT ANNUITIES.

Difference of Age 28 years.

AGES.		D _{xy}	N _{xy}	AGES.		D _{xy}	N _{xy}
(x)	(y)			(x)	(y)		
28	0	14662782.	157504383.	82	54	54970.587	237098.927
29	1	11712631.	142841601.	83	55	44227.318	182128.340
30	2	10154952.	131128970.	84	56	35124.855	137901.022
31	3	8952167.7	120974017.7	85	57	27605.690	102776.167
32	4	8118661.1	112021850.0	86	58	21229.692	75170.477
33	5	7433895.8	103903188.9	87	59	15912.490	53940.785
34	6	6883970.0	96469293.1	88	60	11542.206	38028.295
35	7	6409885.7	89585323.1	89	61	8288.9012	26486.0886
36	8	5988890.4	83175437.4	90	62	5971.6063	18197.1874
37	9	5606390.6	77186547.0	91	63	4048.0428	12225.5811
38	10	5254617.4	71580156.4	92	64	2648.4397	8177.5383
39	11	4926300.0	66325539.0	93	65	1743.8460	5529.0986
40	12	4613643.8	61399239.0	94	66	1179.6804	3785.2526
41	13	4315119.4	56785595.2	95	67	806.81572	2605.57223
42	14	4032023.1	52470475.8	96	68	562.95424	1798.75651
43	15	3763920.7	48438452.7	97	69	400.10306	1235.80227
44	16	3510547.0	44674532.0	98	70	281.81810	835.69921
45	17	3271807.2	41163985.0	99	71	199.99312	553.88111
46	18	3048637.4	37892177.8	100	72	146.66780	353.88799
47	19	2840529.5	34843540.4	101	73	101.24111	207.22019
48	20	2647070.1	32003010.9	102	74	63.49145	105.97908
49	21	2468336.5	29355940.8	103	75	33.00945	42.48763
50	22	2302525.9	26887604.3	104	76	9.47818	9.47818
51	23	2148325.6	24585078.4	Difference of Age 77 years.			
52	24	2002576.9	22436752.8	77	0	317426.67	1378488.12
53	25	1864901.3	20434175.9	78	1	228305.90	1061061.45
54	26	1734634.9	18569274.6	79	2	178153.69	832755.55
55	27	1612153.8	16834639.7	80	3	139869.25	654601.86
56	28	1496153.0	15222485.9	81	4	112555.36	514732.61
57	29	1385675.0	13726332.9	82	5	90184.668	402177.246
58	30	1279414.0	12340657.9	83	6	72492.407	311992.578
59	31	1176982.4	11061243.9	84	7	57903.324	239500.171
60	32	1078125.3	9884261.5	85	8	45981.342	181596.847
61	33	982346.84	8806136.19	86	9	35878.291	135615.505
62	34	893021.81	7823789.35	87	10	27419.227	99737.214
63	35	810369.36	6930767.54	88	11	20375.494	72317.987
64	36	734646.37	6120398.18	89	12	15066.449	51942.493
65	37	664747.66	5385751.81	90	13	11200.939	36876.044
66	38	600491.32	4721004.15	91	14	7847.1088	25675.1052
67	39	541475.12	4120512.83	92	15	5308.6764	17827.9964
68	40	486947.00	3579037.71	93	16	3617.7005	12519.3200
69	41	436466.36	3092090.71	94	17	2535.0492	8901.6195
70	42	389823.64	2655624.35	95	18	1798.2295	6366.5703
71	43	347026.45	2265800.71	96	19	1303.8513	4568.3408
72	44	306515.81	1918774.26	97	20	965.00106	3264.48952
73	45	268006.19	1612258.45	98	21	709.76844	2299.48846
74	46	231820.53	1344252.26	99	22	527.43026	1589.72002
75	47	197897.72	1112431.73	100	23	408.11016	1062.28976
76	48	167981.09	914534.01	101	24	300.17457	654.17960
77	49	141508.81	746552.92	102	25	202.75189	354.00503
78	50	118645.67	605044.11	103	26	115.01080	151.25314
79	51	99348.338	486398.439	104	27	36.24234	36.24234
80	52	82221.737	387050.101				
81	53	67729.437	304828.364				

Difference of Age 77 years.

COMMUTATION TABLES FOR JOINT ANNUITIES.

Difference of Age 29 years.

AGES.		D _{xy}	N _{xy}	AGES.		D _{xy}	N _{xy}
(x)	(y)			(x)	(y)		
29	0	13843081.	147824956.	83	54	44987.424	186275.196
30	1	11045257.	13881875.	84	55	35765.884	141287.772
31	2	9573675.2	12266617.9	85	56	28140.356	105521.888
32	3	8438859.8	11362942.7	86	57	21682.799	77381.532
33	4	7653730.0	104224062.9	87	58	16307.224	55698.733
34	5	7008739.5	97270352.9	88	59	11878.048	39391.509
35	6	6489596.1	92261613.4	89	60	8576.1054	27513.4607
36	7	6042035.4	8772017.3	90	61	6193.2329	18937.3553
37	8	5643519.0	7772781.9	91	62	4205.3567	12744.1224
38	9	5281459.8	72686462.9	92	63	2753.7706	8538.7657
39	10	4948514.7	66895003.1	93	64	1816.0729	5784.9951
40	11	4635291.1	61856482.4	94	65	1230.2265	3968.9222
41	12	4338803.5	57220497.3	95	66	842.62891	2738.63574
42	13	4053026.5	52883623.8	96	67	589.10355	1896.06683
43	14	3784831.4	48830667.3	97	68	419.59324	1306.96328
44	15	3532414.3	45045835.9	98	69	296.37264	887.37004
45	16	3293003.3	41513421.6	99	70	210.88427	590.99740
46	17	3069463.3	38219518.3	100	71	155.83881	380.11313
47	18	2864415.2	35149555.0	101	72	108.64281	224.27432
48	19	2665760.4	32289200.8	102	73	68.87149	115.63151
49	20	2485888.8	29523449.4	103	74	36.28083	46.76002
50	21	2318630.2	27137590.6	104	75	10.47919	10.47919
51	22	2163457.2	24818230.4	Difference of Age 76 years.			
52	23	2016782.0	22655473.2	76	0	371557.38	1658678.05
53	24	1878224.3	20638691.2	77	1	268574.71	1287120.67
54	25	1747415.8	18760466.9	78	2	200903.28	1018545.96
55	26	1624120.4	17012051.1	79	3	166588.25	808642.68
56	27	1507866.1	15388930.7	80	4	134562.14	642054.43
57	28	1397834.3	13881064.6	81	5	109322.49	507492.29
58	29	1292112.9	12482230.3	82	6	88579.204	398169.797
59	30	1188994.6	11191117.4	83	7	71601.997	309590.593
60	31	1089242.0	10021222.8	84	8	57394.013	237988.596
61	32	992400.1	892880.8	85	9	45678.833	180594.583
62	33	902088.86	792480.68	86	10	35695.943	134915.750
63	34	81861.61	7018391.82	87	11	27296.138	99219.807
64	35	742260.00	619710.21	88	12	20277.276	71923.669
65	36	671831.96	545740.21	89	13	14891.117	51646.393
66	37	607081.23	4785613.25	90	14	11142.894	36655.276
67	38	547589.92	4178732.02	91	15	7803.7546	25512.3817
68	39	492799.96	3636942.10	92	16	5275.8132	17708.6271
69	40	442217.37	3138142.14	93	17	3593.4322	12432.8139
70	41	395268.55	2695924.77	94	18	2517.5211	8839.3817
71	42	352086.90	2300656.22	95	19	1785.7094	6321.8606
72	43	311051.58	1948569.42	96	20	1294.7097	4536.1512
73	44	272031.67	1637517.84	97	21	958.18743	3241.44154
74	45	235305.05	1365486.17	98	22	704.83868	2283.25411
75	46	20073.95	1130181.12	99	23	523.74132	1578.41543
76	47	170470.53	920307.17	100	24	405.23567	1054.67411
77	48	143508.60	758836.64	101	25	298.04531	649.43844
78	49	120291.66	615328.04	102	26	201.26892	351.39313
79	50	100799.55	495036.38	103	27	114.16340	150.12421
80	51	83413.914	394336.835	104	28	35.96081	35.96081
81	52	68774.893	310222.921				
82	53	5572.832	242148.028				

Difference of Age 76 years.

COMMUTATION TABLES FOR JOINT ANNUITIES.

Difference of Age 30 years.

AGES.		D _{xy}	N _{xy}	AGES.		D _{xy}	N _{xy}
(x)	(y)			(x)	(y)		
30	0	13054316.	138673033.	84	54	36380.569	144460.572
31	1	10413018.	125618717.	85	55	28653.918	108080.003
32	2	9024730.6	115205698.8	86	56	22102.751	79426.085
33	3	7955592.0	106180968.2	87	57	16655.270	57323.334
34	4	7216001.0	98225376.2	88	58	12172.702	40668.064
35	5	6607217.6	91009375.2	89	59	8825.6435	28495.3616
36	6	6117171.4	84402157.6	90	60	6407.8239	19669.7181
37	7	5693599.2	78284986.2	91	61	4361.4317	13261.8942
38	8	5316436.4	72591387.0	92	62	2860.7867	8900.4625
39	9	4973793.5	67274950.6	93	63	1888.2998	6039.6758
40	10	4656896.7	62301157.1	94	64	1281.1802	4151.3760
41	11	4357809.9	57644260.4	95	65	878.73325	2870.19583
42	12	4073393.5	53286450.5	96	66	615.25285	1991.46258
43	13	3804547.1	49213057.0	97	67	439.08341	1376.20973
44	14	3552038.8	45408509.9	98	68	310.80979	937.12632
45	15	3314421.2	41856471.1	99	69	221.77542	626.31653
46	16	3090595.6	38542049.9	100	70	164.32542	404.54111
47	17	2880360.9	35451454.3	101	71	115.43616	240.21569
48	18	2684450.7	32571093.4	102	72	73.90667	124.77953
49	19	2503441.0	29886642.7	103	73	39.35514	50.87286
50	20	2335117.9	27383201.7	104	74	11.51772	11.51772
51	21	2178588.8	25048083.8	Difference of Age 75 years.			
52	22	2030987.1	22869495.0	75	0	431337.66	1982395.15
53	23	1891547.3	20838507.9	76	1	314374.70	1551057.49
54	24	1759899.4	18946960.6	77	2	246926.21	1236682.79
55	25	1636087.1	17187061.2	78	3	196276.70	989756.58
56	26	1519058.6	15550974.1	79	4	160267.33	793479.88
57	27	1408777.7	14031915.5	80	5	130697.18	633212.55
58	28	1303451.2	12623137.8	81	6	107376.33	502515.37
59	29	1200796.0	11319686.6	82	7	87491.202	395139.037
60	30	1100358.8	10118890.6	83	8	70972.195	307647.835
61	31	1002632.9	9018531.8	84	9	57016.421	236675.640
62	32	911320.76	8015898.95	85	10	45446.675	179659.219
63	33	826093.86	7104578.19	86	11	35535.698	134212.544
64	34	749873.64	6277584.33	87	12	27164.559	98676.846
65	35	678799.66	5527710.69	88	13	20175.890	71512.287
66	36	613555.54	4848911.03	89	14	14913.431	51336.397
67	37	553599.28	4235355.49	90	15	11081.331	36422.966
68	38	498365.07	3681756.21	91	16	7755.4456	25341.6350
69	39	447532.69	3183391.14	92	17	5240.4220	17586.1894
70	40	400476.72	2735858.45	93	18	3568.5862	12345.7674
71	41	357004.61	2335381.73	94	19	2499.9931	8777.1812
72	42	315587.35	1978377.12	95	20	1773.1894	6277.1881
73	43	276057.15	1662789.77	96	21	1285.5681	4503.9987
74	44	238839.36	1386732.62	97	22	951.53224	3218.43063
75	45	203893.31	1147893.26	98	23	699.90892	2266.89839
76	46	173034.27	943999.95	99	24	520.05238	1566.98947
77	47	145635.35	770965.68	100	25	402.36117	1046.93709
78	48	121991.61	625330.33	101	26	295.86536	644.57592
79	49	102096.56	503338.72	102	27	199.78597	348.71056
80	50	84548.405	401242.160	103	28	113.27659	148.92459
81	51	69772.097	316693.755	104	29	35.64800	35.64800
82	52	56735.272	246921.658				
83	53	45725.814	190186.386				

Difference of Age 75 years.

COMMUTATION TABLES FOR JOINT ANNUITIES.

Difference of Age 31 years.

AGES.		D _{xy}	N _{xy}	AGES.		D _{xy}	N _{xy}
(x)	(y)			(x)	(y)		
31	0	12307077.	130033920.4	85	54	29146.374	110475.964
32	1	9815946.2	117726843.4	86	55	22506.126	81329.590
33	2	8507911.7	107910897.2	87	56	16977.850	58823.464
34	3	7500598.9	99402985.5	88	57	12432.505	41845.614
35	4	6802605.4	91902386.6	89	58	9044.5779	29413.1095
36	5	6228042.8	85099781.2	90	59	6504.2717	20368.5316
37	6	5764402.2	78871738.4	91	60	4512.5520	13774.2599
38	7	5363614.1	73107336.2	92	61	2966.9603	9261.7079
39	8	5006732.5	67743722.1	93	62	1961.6823	6294.7476
40	9	4680685.8	62736989.6	94	63	1332.1339	4333.0653
41	10	4377461.0	58056303.8	95	64	915.12876	3000.93142
42	11	4093124.0	53678842.8	96	65	641.61476	2085.80266
43	12	3823665.5	49585718.8	97	66	458.57358	1444.18790
44	13	3570541.9	45762053.3	98	67	325.24696	985.61432
45	14	3332834.6	42191511.4	99	68	232.57873	660.36736
46	15	3109847.1	38858676.8	100	69	172.81203	427.78863
47	16	2899813.4	35748829.7	101	70	121.72254	254.97660
48	17	2703141.0	32849016.3	102	71	78.52799	133.25406
49	18	2520993.3	30145875.3	103	72	42.23238	54.72607
50	19	2351605.6	27624882.0	104	73	12.49369	12.49369
51	20	2194080.7	25273276.4	Difference of Age 74 years.			
52	21	2045192.1	23079195.7	74	0	497789.41	2354266.88
53	22	1904870.2	21034003.6	75	1	364954.79	1856477.47
54	23	1772383.1	19129133.4	76	2	289034.49	1491522.68
55	24	1647775.4	17356750.3	77	3	230896.16	1202488.19
56	25	1530251.1	15708974.9	78	4	188829.30	971592.03
57	26	1419234.7	14178723.8	79	5	155664.05	782762.73
58	27	1313655.7	12759489.1	80	6	128370.51	627098.68
59	28	1211333.0	11445833.4	81	7	106057.45	498728.17
60	29	1111280.4	10234500.4	82	8	86721.641	392670.723
61	30	1012865.7	9123220.0	83	9	70505.273	305949.082
62	31	920717.52	8110354.28	84	10	56726.641	235443.809
63	32	835457.26	7189636.76	85	11	45242.658	178717.168
64	33	757487.27	6354179.50	86	12	35364.402	133474.510
65	34	685762.35	5596692.23	87	13	27028.736	98110.108
66	35	619914.22	4910929.88	88	14	20071.335	71081.372
67	36	559503.21	4291015.66	89	15	14831.036	51010.037
68	37	503834.23	3731512.45	90	16	11012.733	36179.001
69	38	452586.60	3227678.22	91	17	7703.4205	25166.2683
70	39	405290.33	2775091.62	92	18	5204.1882	17462.8478
71	40	361708.61	2369801.29	93	19	3543.7401	12258.6596
72	41	319995.35	2008092.68	94	20	2482.4650	8714.9195
73	42	280082.63	1688097.33	95	21	1760.6693	6232.4545
74	43	242373.66	1408014.70	96	22	1276.6390	4471.7852
75	44	206955.81	1165641.04	97	23	944.87706	3195.14622
76	45	175635.17	958685.23	98	24	694.97916	2250.26916
77	46	147825.60	783050.06	99	25	516.36345	1555.29000
78	47	123799.49	635224.46	100	26	399.41823	1038.92655
79	48	103539.38	511424.97	101	27	293.68540	639.50832
80	49	85721.353	407885.590	102	28	198.23404	345.82292
81	50	70721.050	322164.237	103	29	112.29123	147.58888
82	51	57557.906	251443.187	104	30	35.29765	35.29765
83	52	46431.626	193885.281				
84	53	36977.691	147453.655				

Difference of Age 74 years.

COMMUTATION TABLES FOR JOINT ANNUITIES.

Difference of Age 32 years.

AGES.		D _{xy}	N _{xy}	AGES.		D _{xy}	N _{xy}
(x)	(y)			(x)	(y)		
32	0	11601402.	121881856.3	86	54	22892.925	83112.720
33	1	9253816.8	110280454.3	87	55	17287.695	60219.795
34	2	8021330.6	101026637.5	88	56	12673.298	42932.100
35	3	7070899.1	93005306.9	89	57	9237.6167	30258.8020
36	4	6412217.7	85934407.8	90	58	6757.8533	21021.1853
37	5	5868879.8	79522190.1	91	59	4643.8532	14263.3320
38	6	5430313.5	73653310.3	92	60	3069.7632	9619.4788
39	7	5051161.9	68222996.8	93	61	2034.4870	6549.7156
40	8	4711683.7	63171834.9	94	62	1383.9029	4515.2286
41	9	4399822.6	58460151.2	95	63	951.52428	3131.32571
42	10	4111581.5	54060328.6	96	64	668.18926	2179.80143
43	11	3842186.3	49948747.1	97	65	478.22220	1511.61217
44	12	3588484.3	46106560.8	98	66	339.68412	1033.38997
45	13	3350195.9	42518076.5	99	67	243.38205	693.70585
46	14	3127124.0	39167880.6	100	68	181.23021	450.32380
47	15	2917876.4	36040756.6	101	69	128.00891	269.09359
48	16	2721396.7	33122880.2	102	70	82.80444	141.08468
49	17	2538545.5	30401483.5	103	71	44.87314	58.28024
50	18	2368093.3	27862938.0	104	72	13.40710	13.40710
51	19	2209572.5	25494844.7	Difference of Age 73 years.			
52	20	2059735.4	23285272.2	73	0	566968.89	2774807.85
53	21	1918193.2	21225536.8	74	1	421179.62	2207838.96
54	22	1784866.7	19307343.6	75	2	335537.57	1786659.34
55	23	1659463.7	17522476.9	76	3	270270.84	1451121.77
56	24	1541183.4	15863013.2	77	4	222135.18	1180850.93
57	25	1429691.7	14321829.8	78	5	183405.65	958715.75
58	26	1323406.6	12892138.1	79	6	152892.92	775310.10
59	27	1220816.3	11568731.5	80	7	126793.76	622417.18
60	28	1121031.9	10347915.2	81	8	105124.58	495623.42
61	29	1022918.9	9226883.3	82	9	86151.104	390498.841
62	30	930114.28	8203964.45	83	10	70146.938	304347.737
63	31	844071.77	7273850.17	84	11	56471.986	234200.799
64	32	765239.32	6429778.40	85	12	45024.570	177728.813
65	33	692725.05	5664539.08	86	13	35187.580	132704.243
66	34	626272.91	4971814.03	87	14	26888.669	97516.663
67	35	565301.71	4345541.12	88	15	19960.444	70627.994
68	36	509207.43	3780239.41	89	16	14739.225	50667.550
69	37	457553.38	3271031.98	90	17	10938.857	35928.325
70	38	409867.21	2813478.60	91	18	7650.1568	24989.4681
71	39	366056.24	2403611.39	92	19	5167.9543	17339.3113
72	40	324211.70	2037555.15	93	20	3518.8941	12171.3570
73	41	283994.72	1713343.45	94	21	2464.9369	8652.4629
74	42	245907.97	1429348.73	95	22	1748.4404	6187.5260
75	43	210018.31	1183440.76	96	23	1267.7100	4439.0856
76	44	178273.23	973422.45	97	24	938.22188	3171.37563
77	45	150047.59	795149.22	98	25	690.04939	2233.15375
78	46	125661.34	645101.63	99	26	512.58668	1543.10436
79	47	105073.81	519440.29	100	27	396.47530	1030.51768
80	48	86932.758	414366.476	101	28	291.40405	634.04238
81	49	71702.169	327433.718	102	29	196.50966	342.63833
82	50	58340.736	255731.549	103	30	111.18763	146.12867
83	51	47104.863	197390.813	104	31	34.94104	34.94104
84	52	37548.470	150285.950				
85	53	29624.760	112737.480				

Difference of Age 73 years.

COMMUTATION TABLES FOR JOINT ANNUITIES.

Difference of Age 33 years.

AGES.		D_{xy}	N_{xy}	AGES.		D_{xy}	N_{xy}
(x)	(y)			(x)	(y)		
33	0	10937625.	114130339.7	87	54	17584.868	61528.646
34	1	8724576.3	103253314.7	88	55	12904.585	43943.838
35	2	7561798.7	94528738.4	89	56	9416.5308	31039.2526
36	3	6665114.5	86966939.7	90	57	6962.0864	21622.7218
37	4	5942433.6	80301825.2	91	58	4759.0516	14720.6354
38	5	5328735.9	74250391.6	92	59	3159.0838	9961.5838
39	6	5113975.9	68730655.7	93	60	2104.9805	6802.5000
40	7	4753494.9	63616679.8	94	61	1435.2642	4697.5195
41	8	4428300.5	58863184.9	95	62	988.50212	3262.25532
42	9	4132585.0	54434224.4	96	63	694.76376	2273.75320
43	10	3859512.3	50301639.4	97	64	498.02929	1578.98944
44	11	3605866.1	46442127.1	98	65	354.23865	1080.96015
45	12	3367031.0	42836261.0	99	66	254.18538	726.72150
46	13	3142413.7	39469230.0	100	67	189.64838	472.53612
47	14	2934986.9	36325816.3	101	68	134.24459	282.88774
48	15	2733348.4	33391729.4	102	69	87.08089	148.64315
49	16	2556589.6	30653.81.0	103	70	47.31682	61.56226
50	17	2384581.0	28097691.4	104	71	14.24544	14.24544
51	18	2225064.4	25713110.4	Difference of Age 72 years.			
52	19	2074278.7	23488046.0				
53	20	1931833.4	21413767.3	72	0	638840.79	3245019.07
54	21	1797350.4	19481933.9	73	1	479712.38	2606178.28
55	22	1671152.0	17684583.5	74	2	387230.38	2126465.90
56	23	1552115.6	16013431.5	75	3	313755.01	1739235.52
57	24	1439905.5	14461315.9	76	4	260015.85	1425480.51
58	25	1333157.5	13021410.4	77	5	215754.91	1165464.66
59	26	1229878.1	11688252.9	78	6	180140.67	949709.75
60	27	1129808.3	10458374.8	79	7	151014.97	769569.08
61	28	1031895.0	9328566.5	80	8	125678.50	618554.11
62	29	939346.18	8296671.46	81	9	104432.97	492875.61
63	30	852686.29	7357325.28	82	10	85713.25	388442.64
64	31	773129.82	6504638.99	83	11	69832.037	302729.391
65	32	699814.34	5731509.17	84	12	56199.768	232897.354
66	33	632631.59	5031694.83	85	13	44799.447	176697.586
67	34	571100.22	4399063.24	86	14	35005.232	131898.139
68	35	514484.69	3827963.02	87	15	26740.113	96892.907
69	36	462433.02	3313478.33	88	16	19836.879	70152.794
70	37	414365.17	2851045.31	89	17	14640.351	50315.915
71	38	370190.05	2436680.14	90	18	10863.223	35675.564
72	39	328108.63	2066490.09	91	19	7596.8931	24812.3413
73	40	287736.71	1738381.46	92	20	5131.7205	17215.4482
74	41	249342.71	1450644.75	93	21	3494.0480	12083.7277
75	42	213080.80	1201302.04	94	22	2447.8165	8589.6797
76	43	180911.29	988221.24	95	23	1736.2115	6141.8632
77	44	152301.32	807309.95	96	24	1258.7810	4405.6517
78	45	127550.17	655008.63	97	25	931.56671	3146.87068
79	46	106654.04	527458.46	98	26	685.00225	2215.30397
80	47	88221.078	420804.425	99	27	508.80991	1530.30172
81	48	72715.457	332583.347	100	28	393.39548	1021.49181
82	49	59150.103	259867.890	101	29	288.86922	628.09633
83	50	47745.524	200717.787	102	30	194.57836	339.22711
84	51	38092.905	152972.263	103	31	110.06432	144.64875
85	52	30082.041	114879.358	104	32	34.58443	34.58443
86	53	23268.671	84797.317				

Difference of Age 72 years.

COMMUTATION TABLES FOR JOINT ANNUITIES.

Difference of Age 34 years.

AGES.		$D_{x,y}$	$N_{x,y}$	AGES.		$D_{x,y}$	$N_{x,y}$
(x)	(y)			(x)	(y)		
34	0	10311519.	106932092.8	88	54	13126.368	44893.242
35	1	8224756.3	96620573.8	89	55	9588.3825	31766.8739
36	2	7127842.5	88395817.5	90	56	7035.7660	22178.4914
37	3	6280746.2	81267975.0	91	57	4860.6243	15142.7254
38	4	5692231.0	74987228.8	92	58	3237.4500	10282.1011
39	5	5206664.8	69294997.8	93	59	2166.2289	7044.6511
40	6	4812607.2	64088333.0	94	60	1484.9951	4878.4222
41	7	4468262.8	59275725.8	95	61	1025.1888	3393.4271
42	8	4159953.1	54807463.0	96	62	721.76345	2368.23829
43	9	3879228.1	50647509.9	97	63	517.83636	1646.47484
44	10	3622126.4	46768281.8	98	64	368.91057	1128.63848
45	11	3383340.1	43146155.4	99	65	265.07652	759.72791
46	12	3159209.7	39762815.3	100	66	198.06655	494.65139
47	13	2949371.0	36603605.6	101	67	140.48028	296.58484
48	14	2753561.4	33654234.6	102	68	91.32285	156.10456
49	15	2571609.1	30900673.2	103	69	49.76050	64.78171
50	16	2400685.2	28329064.1	104	70	15.02121	15.02121
51	17	2240556.2	25928378.9	Difference of Age 71 years.			
52	18	2088822.0	23687822.7	71	0	712726.32	3765428.54
53	19	1945473.6	21599000.7	72	1	540523.19	3052702.22
54	20	1810131.3	19653527.1	73	2	441045.10	2512179.03
55	21	1682840.4	17843395.8	74	3	362092.02	2071133.93
56	22	1563047.8	16160555.4	75	4	301850.09	1709041.91
57	23	1450119.4	14597507.6	76	5	252547.55	1407191.82
58	24	1342681.7	13147388.2	77	6	211914.04	1154644.27
59	25	1238939.9	11804706.5	78	7	177928.04	942730.23
60	26	1138194.6	10565766.6	79	8	149686.66	764802.19
61	27	1039973.5	9427572.0	80	9	124851.67	615115.53
62	28	947588.95	8387598.50	81	10	103902.20	490263.86
63	29	861149.68	7440009.55	82	11	85328.469	386361.661
64	30	781020.31	6578859.87	83	12	69495.418	301033.192
65	31	707030.22	5797839.56	84	13	55918.769	231537.774
66	32	639105.90	5090809.34	85	14	44567.289	175619.005
67	33	576898.73	4451703.44	86	15	34811.833	131051.716
68	34	519761.95	3874804.71	87	16	26574.579	96239.883
69	35	467225.52	3355042.76	88	17	19703.809	69665.304
70	36	418784.23	2887817.24	89	18	14539.124	49961.495
71	37	374252.59	2469033.01	90	19	10787.588	35422.371
72	38	331813.91	2094780.42	91	20	7543.6294	24634.7834
73	39	291195.22	1762966.51	92	21	5095.4867	17091.1540
74	40	252628.13	1471771.29	93	22	3467.7798	11995.6673
75	41	216057.03	1219143.16	94	23	2430.6960	8525.8875
76	42	183549.35	1003086.13	95	24	1723.9826	6095.1915
77	43	154555.05	819536.78	96	25	1249.8519	4371.2089
78	44	129465.99	664981.73	97	26	924.75307	3121.35700
79	45	108257.17	535515.74	98	27	679.95512	2196.60393
80	46	89547.856	427258.571	99	28	504.85746	1516.64881
81	47	73793.080	337710.715	100	29	389.97346	1011.79135
82	48	59986.006	263917.635	101	30	286.03021	621.81789
83	49	48407.902	203931.629	102	31	192.61258	335.78768
84	50	38610.997	155523.727	103	32	108.94101	143.17510
85	51	30518.216	116912.730	104	33	34.23409	34.23409
86	52	23627.841	86394.514				
87	53	17873.431	62766.673				

Difference of Age 71 years.

COMMUTATION TABLES FOR JOINT ANNUITIES.

Difference of Age 35 years.

AGES.		D_{xy}	N_{xy}	AGES.		D_{xy}	N_{xy}
(x)	(y)			(x)	(y)		
35	0	9720785.1	100081091.3	89	54	9753.1718	32450.4969
36	1	7752754.2	90360306.2	90	55	7164.1687	22697.3251
37	2	6716789.2	82607552.0	91	56	4954.7648	15533.1564
38	3	5916731.7	75890762.8	92	57	3306.5470	10578.3916
39	4	5360635.6	69974031.1	93	58	2219.9657	7271.8446
40	5	4899833.9	64613395.5	94	59	1528.2038	5051.8789
41	6	4523828.1	59713561.6	95	60	1060.7108	3523.6751
42	7	4196868.2	55189733.5	96	61	748.55055	2462.96427
43	8	3904918.4	50992865.3	97	62	537.96036	1714.41372
44	9	3640629.5	47087946.9	98	63	383.58248	1176.45336
45	10	3398597.0	43447317.4	99	64	276.05550	792.87088
46	11	3174512.2	40048720.4	100	65	206.55315	516.81538
47	12	2964191.9	36874208.2	101	66	146.71596	310.26223
48	13	2767905.1	33910016.3	102	67	95.56481	163.54627
49	14	2585895.8	31142111.2	103	68	52.18449	67.98146
50	15	2415639.2	28556215.4	104	69	15.79697	15.79697
51	16	2255687.8	26140576.2	Difference of Age 70 years.			
52	17	2103365.3	23884888.4	70	0	789116.69	4337317.68
53	18	1959113.8	21781523.1	71	1	603037.74	3548200.99
54	19	1822912.2	19822409.3	72	2	496954.25	2945163.25
55	20	1694807.0	17999497.1	73	3	412413.17	2448209.00
56	21	1573980.0	16304690.1	74	4	348353.03	2035795.83
57	22	1460333.2	14730710.1	75	5	293180.21	1687442.80
58	23	1352205.9	13270376.9	76	6	248051.71	1394262.59
59	24	1247791.0	11918171.0	77	7	209311.15	1146210.88
60	25	1146580.8	10670380.0	78	8	176363.01	936899.73
61	26	1047693.0	9523799.2	79	9	148701.88	760536.72
62	27	955007.45	8476106.17	80	10	124217.12	611834.84
63	28	868706.28	7521098.72	81	11	103435.77	487617.72
64	29	788772.37	6652392.44	82	12	84917.152	384181.953
65	30	714246.11	5863620.07	83	13	69147.941	299264.801
66	31	645695.81	5149373.96	84	14	55628.989	230116.860
67	32	582802.67	4503678.15	85	15	44321.061	174487.871
68	33	525039.21	3920875.48	86	16	34596.331	130166.810
69	34	472018.02	3395836.27	87	17	26396.312	95570.479
70	35	423124.37	2923818.25	88	18	19567.571	69174.167
71	36	378243.86	2500693.88	89	19	14437.896	49606.596
72	37	335455.30	2122450.02	90	20	10711.954	35168.700
73	38	294483.64	1786994.72	91	21	7490.3656	24456.7463
74	39	255664.64	1492511.08	92	22	5060.0955	16966.3807
75	40	218903.86	1236846.44	93	23	3445.5116	11906.2852
76	41	186113.09	1017942.58	94	24	2413.5756	8460.7736
77	42	156808.77	831829.49	95	25	1711.7537	6047.1980
78	43	131381.80	675020.72	96	26	1240.7103	4335.4443
79	44	109883.20	543638.92	97	27	917.93943	3094.73403
80	45	90893.862	433755.717	98	28	674.67322	2176.79460
81	46	74902.872	342861.855	99	29	500.46588	1502.12138
82	47	60874.982	267958.983	100	30	386.14080	1001.65550
83	48	49091.997	207084.001	101	31	283.14051	615.11479
84	49	39146.651	157992.004	102	32	190.64679	332.37419
85	50	30933.287	118845.353	103	33	107.83741	141.72740
86	51	23970.434	87912.066	104	34	33.88999	33.88999
87	52	18149.321	63941.632				
88	53	13341.814	45792.311				

Difference of Age 70 years.

COMMUTATION TABLES FOR JOINT ANNUITIES.

Difference of Age 36 years.

AGES.		$D_{x,y}$	$N_{x,y}$	AGES.		$D_{x,y}$	$N_{x,y}$
(x)	(y)			(x)	(y)		
36	0	9162929.	93614557.9	90	54	7287.2946	23185.1353
37	1	7305663.1	84451628.9	91	55	5045.1803	15897.8407
38	2	6327502.8	77145965.8	92	56	3370.5882	10852.6514
39	3	5572058.2	70818463.0	93	57	2267.3465	7482.0632
40	4	5044731.1	65246404.8	94	58	1566.1134	5214.7167
41	5	4605820.8	60201673.7	95	59	1091.5742	3648.6033
42	6	4249058.6	55595852.9	96	60	774.48727	2557.02907
43	7	3939570.3	51346794.3	97	61	557.92590	1782.54180
44	8	3664739.6	47407224.0	98	62	398.48915	1224.61590
45	9	3415958.2	43742484.4	99	63	287.03448	826.12675
46	10	3188827.3	40326526.2	100	64	215.10821	539.09227
47	11	2978549.7	37137698.9	101	65	153.00234	323.98406
48	12	2781814.2	34159149.2	102	66	99.80676	170.98172
49	13	2599366.2	31377335.0	103	67	54.60846	71.17496
50	14	2429059.4	28777968.8	104	68	16.56650	16.56650
51	15	2269738.6	26348909.4	Difference of Age 69 years.			
52	16	2117570.4	24079170.8	69	0	871364.27	4965363.39
53	17	1972754.1	21961600.4	70	1	667671.63	4093999.12
54	18	1835693.1	19988846.3	71	2	554429.80	3426327.49
55	19	1706773.6	18153153.2	72	3	464692.79	2871897.69
56	20	1585172.6	16446379.6	73	4	396764.83	2407204.90
57	21	1470547.0	14861207.0	74	5	338347.46	2010440.07
58	22	1361730.1	13390660.0	75	6	287961.02	1672092.61
59	23	1256642.1	12028929.9	76	7	245004.94	1384131.59
60	24	1154772.1	10772287.8	77	8	207470.07	1139126.65
61	25	1055412.5	9617515.7	78	9	175202.72	931656.58
62	26	962096.23	8562103.24	79	10	147946.12	756453.86
63	27	875507.21	7600007.01	80	11	123659.49	608507.74
64	28	795693.86	6724499.80	81	12	102937.16	484848.25
65	29	721335.40	5928805.94	82	13	84492.565	381911.094
66	30	652285.72	5207470.54	83	14	68789.605	297418.529
67	31	588812.03	4555184.82	84	15	55321.647	228628.924
68	32	530412.42	3966372.79	85	16	44046.693	173307.277
69	33	476810.53	3435960.37	86	17	34364.252	129260.584
70	34	427464.51	2959149.84	87	18	26213.800	94896.332
71	35	382163.85	2531685.33	88	19	19431.333	68682.532
72	36	339032.81	2149521.48	89	20	14336.668	49251.199
73	37	297715.36	1810488.67	90	21	10636.319	34914.531
74	38	258551.82	1512773.31	91	22	7438.3407	24278.2118
75	39	221535.02	1254221.49	92	23	5024.7043	16839.8711
76	40	188565.37	1032686.47	93	24	3421.2433	11815.1668
77	41	158999.02	844121.10	94	25	2396.4551	8393.9235
78	42	133297.62	685122.08	95	26	1699.2337	5997.4684
79	43	111509.23	551824.46	96	27	1231.5687	4298.2347
80	44	92259.096	440315.231	97	28	910.80888	3066.66601
81	45	76028.747	348056.135	98	29	668.80446	2155.85713
82	46	61790.496	272027.388	99	30	495.54729	1487.05267
83	47	49819.527	210236.892	100	31	382.23968	991.50538
84	48	39699.868	160417.365	101	32	280.25080	609.26570
85	49	31362.427	120717.497	102	33	188.71548	329.01490
86	50	24296.449	89355.070	103	34	106.75352	140.29942
87	51	18412.478	65058.621	104	35	33.54590	33.54590
88	52	13547.755	46646.143				
89	53	9913.2527	33098.3880				

Difference of Age 69 years.

COMMUTATION TABLES FOR JOINT ANNUITIES.

Difference of Age 37 years.

AGES.		D_{xy}	N_{xy}	AGES.		D_{xy}	N_{xy}
(x)	(y)			(x)	(y)		
37	0	8634515.	87510649.5	91	54	5131.8976	16240.6529
38	1	6882247.3	78876134.5	92	55	3432.1014	11108.7553
39	2	5958900.3	71993887.2	93	56	2311.2605	7676.6539
40	3	5243694.5	66034986.9	94	57	1599.5390	5365.3934
41	4	4742023.5	60791292.4	95	58	1118.6525	3765.8544
42	5	4326071.2	56049268.9	96	59	797.02244	2647.20195
43	6	3988561.0	51723197.7	97	60	577.25762	1850.17951
44	7	3697260.3	47734636.7	98	61	413.27844	1272.92189
45	8	3438580.4	44037376.4	99	62	298.18913	859.64345
46	9	3205117.0	40598796.0	100	63	223.66325	561.45432
47	10	2991981.2	37393679.0	101	64	159.33941	337.79107
48	11	2795288.6	34401697.8	102	65	104.08321	178.45166
49	12	2612428.3	31606409.2	103	66	57.03243	74.36845
50	13	2441712.7	28993980.9	104	67	17.33602	17.33602
51	14	2282348.3	26552268.2	Difference of Age 68 years.			
52	15	2130760.8	24269919.9	68	0	959501.48	5653809.64
53	16	1986077.0	22139159.1	69	1	737261.31	4694308.16
54	17	1848474.0	20153082.1	70	2	613853.87	3957046.85
55	18	1718740.2	18304608.1	71	3	518437.12	3343192.98
56	19	1596365.1	16585867.9	72	4	447060.78	2824755.86
57	20	1481004.0	14989502.8	73	5	385368.75	2377695.08
58	21	1371254.2	13508498.8	74	6	332324.21	1992326.33
59	22	1265493.2	12137244.6	75	7	284424.05	1660002.12
60	23	1162963.3	10871751.4	76	8	242849.90	1375578.07
61	24	1062952.4	9708788.1	77	9	206105.14	1132728.17
62	25	969185.02	8645835.72	78	10	174312.27	926623.03
63	26	882005.89	7676650.70	79	11	147281.96	752310.76
64	27	801923.19	6794644.81	80	12	123063.40	605028.80
65	28	727665.13	5992721.62	81	13	102422.48	481965.40
66	29	658760.02	5265056.49	82	14	84054.712	379542.924
67	30	594821.39	4606296.47	83	15	68409.552	295488.212
68	31	535881.58	4011475.08	84	16	54979.180	227078.660
69	32	481690.17	3475593.50	85	17	43751.219	172099.480
70	33	431804.65	2993903.33	86	18	34126.648	128348.261
71	34	386083.85	2562098.68	87	19	26031.288	94221.613
72	35	342546.43	2176014.83	88	20	19295.096	68190.325
73	36	300890.39	1833468.40	89	21	14235.440	48895.229
74	37	261389.22	1532578.01	90	22	10562.444	34659.789
75	38	224036.78	1271188.79	91	23	7386.3157	24097.3453
76	39	190831.87	1047152.01	92	24	4989.3132	16711.0296
77	40	161094.03	856320.14	93	25	3396.9751	11721.7164
78	41	135159.47	695226.11	94	26	2378.9270	8324.7413
79	42	113135.27	560066.64	95	27	1686.7136	5945.8143
80	43	93624.331	446931.369	96	28	1222.0019	4259.1007
81	44	77170.705	353307.038	97	29	902.88605	3037.09885
82	45	62719.277	276136.333	98	30	662.23144	2134.21280
83	46	50568.775	213417.056	99	31	490.54088	1471.98136
84	47	40288.209	162848.281	100	32	378.33858	981.44048
85	48	31805.638	122560.072	101	33	277.41179	603.10190
86	49	24633.516	90754.434	102	34	186.81867	325.69011
87	50	18662.901	66120.918	103	35	105.66963	138.87144
88	51	13744.191	47458.017	104	36	33.20181	33.20181
89	52	10066.271	33713.826				
90	53	7406.9026	23647.5555				

Difference of Age 68 years.

COMMUTATION TABLES FOR JOINT ANNUITIES.

Difference of Age 38 years.

AGES.		D_{xy}	N_{xy}	AGES.		D_{xy}	N_{xy}
(x)	(y)			(x)	(y)		
38	0	8134082.6	81750278.3	92	54	3491.0867	11349.2840
39	1	6481328.6	73616195.7	93	55	2353.4410	7858.1973
40	2	5607739.8	67134867.1	94	56	1630.5189	5504.7563
41	3	4929048.2	61527127.3	95	57	1142.5279	3874.2374
42	4	4454001.2	56598079.1	96	58	816.79387	2731.70952
43	5	4060852.2	52144077.9	97	59	594.05402	1914.91565
44	6	3743237.7	48083225.7	98	60	427.59822	1320.86163
45	7	3469094.2	44339988.0	99	61	309.25594	893.26341
46	8	3226342.9	40870893.8	100	62	232.35519	584.00747
47	9	3007265.3	37644550.9	101	63	165.67649	351.65228
48	10	2807893.7	34637285.6	102	64	108.39415	185.97579
49	11	2625082.2	31829391.9	103	65	59.47612	77.58164
50	12	2453982.7	29204309.7	104	66	18.10552	18.10552
51	13	2294237.4	26750327.0	Difference of Age 67 years.			
52	14	2142598.4	24456089.6				
53	15	1998448.4	22313491.2	67	0	1054274.0	6407426.96
54	16	1860957.7	20315042.8	68	1	811834.20	5353152.96
55	17	1730706.8	18454085.1	69	2	677834.27	4541318.76
56	18	1607557.6	16723378.3	70	3	574003.48	3863484.49
57	19	1491461.0	15115820.7	71	4	498765.88	3289481.01
58	20	1381005.2	13624359.7	72	5	434220.08	2790715.13
59	21	1274344.2	12243354.5	73	6	378508.43	2356495.05
60	22	1171154.6	10969010.3	74	7	328242.34	1977986.62
61	23	1070492.4	9797855.7	75	8	281922.29	1649744.28
62	24	976108.95	8727363.35	76	9	241252.21	1367821.99
63	25	888504.56	7751254.40	77	10	205057.63	1126569.78
64	26	807875.67	6862749.84	78	11	173529.76	921512.15
65	27	733361.87	6054874.17	79	12	146572.01	747982.39
66	28	664540.65	5321512.30	80	13	122448.09	601410.38
67	29	600725.33	4656971.65	81	14	101891.71	478962.29
68	30	541350.73	4056246.32	82	15	83590.321	377070.577
69	31	486656.94	3514895.59	83	16	67986.065	293480.256
70	32	436223.70	3028238.65	84	17	54610.369	225494.191
71	33	390003.84	2592014.95	85	18	43448.710	170883.822
72	34	346060.06	2202011.11	86	19	33889.043	127435.112
73	35	304008.72	1855951.05	87	20	25848.776	93546.069
74	36	264176.84	1551942.33	88	21	19158.858	67697.293
75	37	226495.40	1287765.49	89	22	14136.567	48538.435
76	38	192986.90	1061270.09	90	23	10488.568	34401.868
77	39	163030.34	868283.19	91	24	7334.2906	23913.3004
78	40	136940.37	705252.85	92	25	4953.9220	16579.0093
79	41	114715.50	568312.48	93	26	3372.1290	11625.0878
80	42	94989.565	453596.983	94	27	2361.3990	8252.9588
81	43	78312.665	358607.418	95	28	1673.6112	5891.5598
82	44	63661.326	280294.753	96	29	1211.3721	4217.9486
83	45	51328.881	216633.427	97	30	894.01248	3006.57647
84	46	40894.113	165304.546	98	31	655.54105	2112.56399
85	47	32276.989	124410.433	99	32	485.53446	1457.02294
86	48	24981.635	92133.444	100	33	374.50592	971.48848
87	49	18921.813	67151.809	101	34	274.62349	596.98256
88	50	13931.122	48229.996	102	35	184.92186	322.35907
89	51	10212.228	34298.874	103	36	104.58574	137.43721
90	52	7521.2338	24086.6464	104	37	32.85147	32.85147
91	53	5216.1286	16565.4126				

Difference of Age 67 years.

COMMUTATION TABLES FOR JOINT ANNUITIES.

Difference of Age 41 years.

AGES.		D_{xy}	N_{xy}	AGES.		D_{xy}	N_{xy}
(x)	(y)			(x)	(y)		
41	0	6776255.4	66352848.6	95	54	1206.2929	4154.1060
42	1	5385153.5	59576593.2	96	55	865.90355	2947.81313
43	2	4647545.9	54191439.7	97	56	633.82664	2081.90958
44	3	4078536.7	49543893.8	98	57	460.58068	1448.08294
45	4	3681638.0	45465357.1	99	58	337.44996	987.50226
46	5	3355179.5	41783719.1	100	59	256.58310	650.05230
47	6	3092022.7	38428539.6	101	60	184.68771	393.46920
48	7	2866137.9	35336516.9	102	61	121.43042	208.78149
49	8	2667942.4	32470379.0	103	62	66.90571	87.35107
50	9	2489642.1	29802436.6	104	63	20.44536	20.44536
51	10	2327382.8	27312794.5	Difference of Age 64 years.			
52	11	2175067.1	24985411.7				
53	12	2030169.8	22810344.6	64	0	1384296.9	9111613.64
54	13	1892761.3	20780174.8	65	1	1071116.0	7727316.74
55	14	1762988.9	18887413.5	66	2	899349.63	6656200.74
56	15	1639833.7	17124424.6	67	3	766878.91	5756851.11
57	16	1522588.9	15484590.9	68	4	671459.13	4989972.20
58	17	1410258.0	13962002.0	69	5	592266.29	4318513.07
59	18	1301529.7	12551744.0	70	6	526814.30	3726246.78
60	19	1196118.4	11250214.3	71	7	469971.74	3199432.48
61	20	1093291.7	10054095.9	72	8	417546.34	2729460.74
62	21	996880.73	8960804.18	73	9	368132.90	2311914.40
63	22	907547.18	7963923.45	74	10	321571.96	1943781.50
64	23	825456.24	7056376.27	75	11	277393.25	1622209.54
65	24	749565.97	6230920.03	76	12	237796.72	1344816.29
66	25	679685.88	5481354.06	77	13	202137.30	1107019.57
67	26	615274.30	4801668.18	78	14	170939.36	904882.27
68	27	555839.21	4186393.88	79	15	144281.82	733942.91
69	28	500860.18	3630554.67	80	16	120390.62	589661.09
70	29	449638.69	3129694.49	81	17	100025.97	469270.47
71	30	402120.19	2680055.80	82	18	81945.051	369244.503
72	31	356792.58	2277935.61	83	19	66596.156	287299.452
73	32	313420.40	1921143.03	84	20	53477.592	220703.296
74	33	272390.36	1607722.63	85	21	42541.184	167225.704
75	34	233655.61	1335332.27	86	22	33181.755	124684.520
76	35	199229.07	1101676.66	87	23	25309.729	91502.765
77	36	168458.33	902447.59	88	24	18759.649	66193.036
78	37	141689.43	733989.26	89	25	13839.946	47433.387
79	38	118952.34	592299.83	90	26	10265.182	33593.441
80	39	98758.383	473347.494	91	27	7175.7381	23328.2594
81	40	81625.955	374589.111	92	28	4843.5352	16152.5213
82	41	66460.940	292963.156	93	29	3292.3905	11308.9861
83	42	53641.775	226502.216	94	30	2299.8469	8016.5956
84	43	42755.730	172860.441	95	31	1626.1515	5716.7487
85	44	33754.357	130104.711	96	32	1175.2307	4090.5972
86	45	26119.926	96350.354	97	33	867.07484	2915.36646
87	46	19766.461	70230.428	98	34	635.82200	2048.29162
88	47	14536.272	50463.967	99	35	470.95437	1412.46962
89	48	10643.034	35927.695	100	36	363.21325	941.51525
90	49	7841.3612	25284.6614	101	37	266.20785	578.30200
91	50	5446.5252	17443.3002	102	38	179.12797	312.09415
92	51	3655.4029	11996.7750	103	39	101.21581	132.96618
93	52	2470.7374	8341.3721	104	40	31.75037	31.75037
94	53	1716.5287	5870.6347				

Difference of Age 64 years.

COMMUTATION TABLES FOR JOINT ANNUITIES.

Difference of Age 42 years.

AGES.		D _{x,y}	N _{x,y}	AGES.		D _{x,y}	N _{x,y}
(x)	(y)			(x)	(y)		
42	0	6364677.3	61801380.4	96	54	880.78527	3009.60883
43	1	5055005.2	55436703.1	97	55	645.39398	2128.82356
44	2	4361690.6	50381697.9	98	56	469.50120	1483.42958
45	3	3826841.2	46020007.3	99	57	344.65218	1013.92838
46	4	3454398.4	42193166.1	100	58	262.94806	669.27620
47	5	3148064.5	38738767.7	101	59	190.06155	406.32814
48	6	2901779.9	35590703.2	102	60	125.63789	216.26659
49	7	2691617.5	32688923.3	103	61	69.38880	90.62870
50	8	2506129.8	29997305.8	104	62	21.23990	21.23990
51	9	2339271.9	27491176.0	Difference of Age 63 years.			
52	10	2184875.4	25151904.1	63	0	1511319.2	10180020.6
53	11	2040003.4	22967028.7	64	1	1171253.6	8668701.4
54	12	1902272.6	20927025.3	65	2	984778.53	7497447.80
55	13	1772172.6	19024752.7	66	3	840965.32	6512669.27
56	14	1648943.9	17252580.1	67	4	737780.95	5671703.95
57	15	1532073.1	15603636.2	68	5	652173.16	4933923.00
58	16	1419782.2	14071563.1	69	6	581722.79	4281749.84
59	17	1310591.5	12651780.9	70	7	520343.54	3700027.05
60	18	1204504.7	11341189.4	71	8	465837.92	3179683.51
61	19	1101011.2	10136684.7	72	9	414799.32	2713845.59
62	20	1003969.5	9035673.5	73	10	366261.90	2299046.27
63	21	913894.72	8031704.04	74	11	320128.37	1932784.37
64	22	831270.29	7117809.32	75	12	276056.10	1612656.00
65	23	754882.94	6286539.03	76	13	236607.74	1336599.90
66	24	684541.61	5531656.09	77	14	201089.79	1099992.16
67	25	619807.69	4847114.48	78	15	169994.94	898902.37
68	26	559965.06	4227306.79	79	16	143388.65	728907.43
69	27	504781.32	3667341.73	80	17	119583.02	585518.78
70	28	453584.27	3162560.41	81	18	99334.364	465935.756
71	29	406111.46	2708976.14	82	19	81374.514	366601.392
72	30	360433.97	2302864.68	83	20	66129.233	285226.878
73	31	316652.12	1942430.71	84	21	53100.000	219097.645
74	32	275177.99	1625778.59	85	22	42245.710	165997.645
75	33	236027.97	1350600.60	86	23	32949.676	123751.935
76	34	201272.63	1114572.63	87	24	25131.462	90802.259
77	35	170204.18	913300.00	88	25	18626.579	65670.797
78	36	143200.50	743095.82	89	26	13738.718	47044.218
79	37	120257.75	599895.32	90	27	10189.548	33305.500
80	38	99873.645	479637.574	91	28	7119.9969	23115.9525
81	39	82607.075	379763.929	92	29	4801.4029	15095.9556
82	40	67336.648	297156.854	93	30	3260.0329	11194.5527
83	41	54391.023	229820.206	94	31	2276.6120	7934.5198
84	42	43379.196	175429.183	95	32	1609.5551	5657.9078
85	43	34253.849	132049.987	96	33	1163.3254	4048.3527
86	44	26512.250	97796.138	97	34	858.35973	2885.02728
87	45	20063.574	71283.888	98	35	629.36636	2026.66755
88	46	14754.887	51220.314	99	36	466.12362	1397.30119
89	47	10800.761	36465.427	100	37	359.38059	931.17757
90	48	7952.1744	25664.6664	101	38	263.31814	571.79698
91	49	5522.0854	17712.4920	102	39	177.12769	308.47884
92	50	3705.1191	12190.4066	103	40	100.01369	131.35115
93	51	2506.5620	8485.2875	104	41	31.33746	31.33746
94	52	1743.0247	5978.7255				
95	53	1226.0920	4235.7008				

Difference of Age 63 years.

COMMUTATION TABLES FOR JOINT ANNUITIES.

Difference of Age 43 years.

AGES.		D _{x,y}	N _{x,y}	AGES.		D _{x,y}	N _{x,y}
(x)	(y)			(x)	(y)		
43	0	5974477.3	57520495.2	97	54	656.48595	2172.33428
44	1	4744088.4	51546017.9	98	55	478.06960	1515.84833
45	2	4092521.0	46801929.5	99	56	351.32740	1037.77873
46	3	3590639.3	42709408.5	100	57	268.56017	686.45133
47	4	3241158.6	39118769.2	101	58	194.77633	417.89116
48	5	2954373.6	35877610.6	102	59	129.29357	223.11483
49	6	2725089.2	32923237.0	103	60	71.79308	93.82126
50	7	2528369.0	30198147.8	104	61	22.02818	22.02818
51	8	2354763.7	27669778.8	Difference of Age 62 years.			
52	9	2196036.5	25315015.1	62	0	1648554.2	11342948.5
53	10	2049202.6	23118978.6	63	1	1278727.2	9694394.3
54	11	1911486.8	21069776.0	64	2	1076844.6	8415667.1
55	12	1781077.9	19158289.2	65	3	920848.32	7338822.50
56	13	1657533.5	17377211.3	66	4	809056.27	6417974.18
57	14	1540584.6	15719677.8	67	5	716590.04	5608917.91
58	15	1428626.0	14179093.2	68	6	640563.19	4892327.87
59	16	1319442.6	12750467.2	69	7	574577.60	4251764.68
60	17	1212891.0	11431024.6	70	8	515766.67	3677187.08
61	18	1108730.6	10218133.6	71	9	462773.20	3161420.41
62	19	1011058.3	9109403.0	72	10	412691.15	2698647.21
63	20	920393.39	8098344.71	73	11	364617.69	2285956.06
64	21	837084.34	7177951.32	74	12	318585.22	1921338.37
65	22	760199.91	6340866.98	75	13	274675.82	1602753.15
66	23	689397.34	5580667.07	76	14	235381.60	1328077.33
67	24	624235.64	4891269.73	77	15	199978.80	1092695.73
68	25	564090.92	4267034.09	78	16	168942.59	892716.93
69	26	508528.19	3702943.17	79	17	142426.77	723774.34
70	27	457135.30	3194414.98	80	18	118756.19	581347.57
71	28	409675.09	2737279.68	81	19	98642.755	462591.381
72	29	364011.48	2327604.59	82	20	80803.977	363948.626
73	30	319883.85	1963593.11	83	21	65662.311	283144.649
74	31	278015.38	1643709.26	84	22	52731.189	217482.338
75	32	238443.46	1365693.88	85	23	41950.236	164751.149
76	33	203316.20	1127250.42	86	24	32717.597	122800.913
77	34	171950.03	923934.22	87	25	24953.194	90083.316
78	35	144684.58	751984.19	88	26	18490.341	65130.122
79	36	121540.26	607299.61	89	27	13637.491	46639.781
80	37	100969.68	485759.35	90	28	10110.396	33002.290
81	38	83539.943	384789.672	91	29	7058.0624	22891.8944
82	39	68146.014	301249.729	92	30	4754.2146	15833.8320
83	40	55107.694	233103.715	93	31	3227.0974	11079.6174
84	41	43985.100	177996.021	94	32	2253.3771	7852.5200
85	42	34753.340	134010.921	95	33	1593.2500	5599.1429
86	43	26904.574	99257.581	96	34	1151.6326	4005.8929
87	44	20364.931	72353.007	97	35	849.64461	2854.26035
88	45	14976.669	51988.076	98	36	622.91072	2004.61574
89	46	10963.196	37011.407	99	37	461.20504	1381.70502
90	47	8070.0235	26048.2115	100	38	355.47949	920.49998
91	48	5600.1229	17978.1880	101	39	260.37774	565.02049
92	49	3756.5205	12378.0651	102	40	175.02396	304.64275
93	50	2540.6531	8621.5446	103	41	98.71301	129.61879
94	51	1768.2977	6080.8915	104	42	30.90578	30.90578
95	52	1245.0177	4312.5938				
96	53	895.2418	3067.5761				

Difference of Age 62 years.

COMMUTATION TABLES FOR JOINT ANNUITIES.

Difference of Age 44 years.

AGES.		D_{xy}	N_{xy}	AGES.		D_{xy}	N_{xy}
(x)	(y)			(x)	(y)		
44	0	5607006.8	53497339.0	98	54	486.28587	1545.89447
45	1	4451320.3	47890332.2	99	55	357.73913	1059.60860
46	2	3839920.7	43439011.9	100	56	273.76164	701.86947
47	3	3368989.4	39599091.2	101	57	198.93346	428.10783
48	4	3041740.0	36230101.8	102	58	132.50089	229.17437
49	5	2774480.5	33188361.8	103	59	73.88203	96.67348
50	6	2559810.7	30413881.3	104	60	22.79145	22.79145
51	7	2375659.7	27854070.6	Difference of Age 61 years.			
52	8	2210579.8	25478410.9				
53	9	2059670.7	23267831.1	61	0	1795224.5	12606410.2
54	10	1920106.4	21208160.4	62	1	1394841.7	10811185.7
55	11	1789705.0	19288054.0	63	2	1175655.2	9416344.0
56	12	1665862.8	17498349.0	64	3	1006937.6	8240688.8
57	13	1548609.8	15832486.2	65	4	885908.24	7233751.16
58	14	1436562.9	14283876.4	66	5	785818.16	6347842.92
59	15	1327661.4	12847313.5	67	6	703833.32	5562024.76
60	16	1221082.3	11519652.1	68	7	632695.28	4858191.44
61	17	1116450.1	10298569.8	69	8	569523.69	4225496.16
62	18	1018147.1	9182119.7	70	9	512373.47	3655972.47
63	19	926892.07	8163972.60	71	10	460421.20	3143599.00
64	20	843036.81	7237080.53	72	11	410838.51	2683177.80
65	21	765516.88	6394043.72	73	12	362860.09	2272339.29
66	22	694253.06	5628526.84	74	13	316992.30	1909479.20
67	23	628663.58	4934273.78	75	14	273252.41	1592486.90
68	24	568120.83	4305610.20	76	15	234081.15	1319234.49
69	25	512275.05	3737489.37	77	16	198740.84	1085153.34
70	26	460528.50	3225214.32	78	17	167809.29	886412.50
71	27	412882.36	2764685.82	79	18	141441.99	718603.21
72	28	367205.69	2351803.46	80	19	117929.35	577161.22
73	29	323058.87	1984597.77	81	20	97951.146	459231.873
74	30	280852.79	1661538.90	82	21	80233.440	361280.727
75	31	240902.08	1380686.11	83	22	65206.247	281047.287
76	32	205396.92	1139784.03	84	23	52362.378	215841.040
77	33	173695.87	934387.11	85	24	41654.763	163478.662
78	34	146168.67	760691.24	86	25	32485.518	121823.899
79	35	122799.86	614522.57	87	26	24770.683	89338.381
80	36	102046.48	491722.71	88	27	18354.103	64567.698
81	37	84456.727	389676.233	89	28	13531.555	46213.595
82	38	68915.575	305219.506	90	29	10022.449	32682.040
83	39	55770.073	236303.931	91	30	6988.6957	22659.5906
84	40	44564.660	180533.858	92	31	4706.1838	15670.8949
85	41	35238.761	135969.198	93	32	3194.1620	10964.7111
86	42	27296.898	100730.437	94	33	2230.5498	7770.5491
87	43	20666.287	73433.539	95	34	1577.2359	5539.9993
88	44	15201.620	52767.252	96	35	1139.9398	3962.7634
89	45	11127.985	37565.632	97	36	840.9295	2822.8236
90	46	8191.3906	26437.6467	98	37	616.3377	1981.8941
91	47	5683.1152	18246.2561	99	38	456.19863	1365.55641
92	48	3809.6073	12563.1409	100	39	351.50994	909.35778
93	49	2575.8998	8753.5336	101	40	257.28524	557.84784
94	50	1792.3479	6177.6338	102	41	172.74779	300.56260
95	51	1263.0699	4385.2859	103	42	97.35323	127.81481
96	52	909.06054	3122.21601	104	43	30.46158	30.46158
97	53	667.26100	2213.15547				

Difference of Age 61 years.

COMMUTATION TABLES FOR JOINT ANNUITIES.

Difference of Age 45 years.

AGES.		D _{xy}	N _{xy}	AGES.		D _{xy}	N _{xy}
(x)	(y)			(x)	(y)		
45	0	5260986.0	49717311.1	99	54	363.88735	1079.92981
46	1	4176574.0	44456325.1	100	55	278.75779	716.04246
47	2	3602882.7	40279751.1	101	56	202.78640	437.28467
48	3	3161705.7	36676868.4	102	57	135.32887	234.49827
49	4	2856527.1	33515162.7	103	58	75.71479	99.16940
50	5	2606206.3	30658635.6	104	59	23.45461	23.45461
51	6	2405202.4	28052429.3	Difference of Age 60 years.			
52	7	2230196.3	25647226.9	60	0	1950299.1	13975319.0
53	8	2073310.9	23417030.6	61	1	1518939.4	12025019.9
54	9	1929915.0	21343719.7	62	2	1282410.3	10506080.5
55	10	1797775.6	19413804.7	63	3	1099333.6	9223670.2
56	11	1673931.8	17616029.1	64	4	968730.97	8124336.62
57	12	1556391.7	15942097.3	65	5	860462.74	7155605.65
58	13	1444046.1	14385705.6	66	6	771829.04	6295142.91
59	14	1335037.3	12941659.5	67	7	695188.28	5523313.87
60	15	1228688.4	11606622.2	68	8	627130.17	4828125.59
61	16	1123990.1	10377933.8	69	9	565776.82	4200995.42
62	17	1025235.8	9253943.7	70	10	509769.38	3635218.60
63	18	933390.73	8228707.93	71	11	458354.30	3125449.22
64	19	848989.29	7295317.20	72	12	408858.11	2667094.92
65	20	770960.44	6446327.91	73	13	361045.79	2258236.81
66	21	699108.79	5675367.47	74	14	315349.59	1897191.02
67	22	633091.54	4976258.68	75	15	271742.73	1581841.43
68	23	572150.73	4343167.14	76	16	232632.08	1310098.70
69	24	515934.78	3771016.41	77	17	197407.65	1077466.62
70	25	463921.70	3255081.63	78	18	166649.01	880058.97
71	26	415947.08	2791159.93	79	19	140457.21	713409.96
72	27	370080.47	2375212.85	80	20	117102.52	572952.75
73	28	325893.72	2005132.38	81	21	97259.537	455850.227
74	29	283640.41	1679238.66	82	22	79676.172	358590.690
75	30	243360.71	1395598.25	83	23	64750.184	278914.518
76	31	207514.80	1152237.54	84	24	51993.567	214164.334
77	32	175473.46	944722.74	85	25	41359.289	162170.767
78	33	147652.75	769249.28	86	26	32247.914	120811.478
79	34	124059.46	621596.53	87	27	24588.171	88563.564
80	35	103104.06	497537.07	88	28	18211.529	63975.393
81	36	85357.428	394433.006	89	29	13413.848	45763.864
82	37	69671.869	309075.578	90	30	9923.948	32350.016
83	38	56399.875	239403.709	91	31	6918.0904	22426.0682
84	39	45100.314	183003.834	92	32	4658.1529	15507.9778
85	40	35703.077	137903.520	93	33	3161.8043	10849.8249
86	41	27678.170	102200.443	94	34	2208.1302	7688.0206
87	42	20967.644	74522.273	95	35	1561.2219	5479.8904
88	43	15426.571	53554.629	96	36	1128.2470	3918.6685
89	44	11295.129	38128.058	97	37	832.05592	2790.42151
90	45	8314.5164	26832.9294	98	38	609.64731	1958.36559
91	46	5768.5849	18518.4130	99	39	451.10438	1348.71828
92	47	3866.0647	12749.8281	100	40	347.33508	897.61390
93	48	2612.3022	8883.7634	101	41	253.93927	550.27882
94	49	1817.2133	6271.4612	102	42	170.36815	296.33955
95	50	1280.2485	4454.2479	103	43	95.95401	125.97140
96	51	922.24149	3173.99937	104	44	30.01739	30.01739
97	52	677.56068	2251.75788				
98	53	494.26739	1574.19720				

Difference of Age 60 years.

COMMUTATION TABLES FOR JOINT ANNUITIES.

Difference of Age 46 years.

AGES.		D_{xy}	N_{xy}	AGES.		D_{xy}	N_{xy}
(x)	(y)			(x)	(y)		
46	0	4936265.2	46166818.2	100	54	283.54862	729.35300
47	1	3918754.4	41230553.0	101	55	206.48725	445.80438
48	2	3381208.2	37311798.6	102	56	137.94992	239.31713
49	3	2969188.0	33930590.4	103	57	77.33078	101.36721
50	4	2683276.7	30961402.4	104	58	24.03643	24.03643
51	5	2448795.8	28278125.7	Difference of Age 59 years.			
52	6	2257930.0	25829329.9				
53	7	2091709.3	23571399.9	59	0	2107399.1	15448282.0
54	8	1942695.9	21479690.6	60	1	1650148.1	13340882.9
55	9	1806959.2	19536994.7	61	2	1396505.1	11690734.8
56	10	1681480.2	17730035.5	62	3	1199158.3	10294229.7
57	11	1563930.5	16048555.3	63	4	1057621.2	9095071.4
58	12	1451302.7	14484624.8	64	5	940906.6	8037450.2
59	13	1341991.7	13033322.1	65	6	845144.81	7096543.57
60	14	1235514.5	11691330.4	66	7	762348.82	6251398.76
61	15	1130991.4	10455815.9	67	8	689073.48	5489049.94
62	16	1032159.8	9324824.5	68	9	623004.31	4799976.46
63	17	939889.41	8292664.68	69	10	562901.32	4176972.15
64	18	854941.77	7352775.27	70	11	507480.94	3614070.83
65	19	776404.00	6497833.50	71	12	456144.84	3106589.89
66	20	704080.12	5721429.50	72	13	406813.82	2650445.05
67	21	637519.49	5017349.38	73	14	359174.79	2243631.23
68	22	576180.64	4379829.89	74	15	313607.33	1884456.44
69	23	519594.51	3803649.25	75	16	270060.51	1570849.11
70	24	467235.99	3284054.74	76	17	231071.53	1300788.60
71	25	419011.80	2816818.75	77	18	196042.71	1069717.07
72	26	372827.48	2397806.95	78	19	165488.73	873674.36
73	27	328445.08	2024979.47	79	20	139472.42	708185.63
74	28	286129.35	1696534.39	80	21	116275.69	568713.21
75	29	245776.20	1410405.04	81	22	96584.012	452437.517
76	30	209632.67	1164628.84	82	23	79118.902	355853.505
77	31	177282.79	954996.17	83	24	64294.120	276734.603
78	32	149163.81	777713.38	84	25	51624.756	212440.483
79	33	125319.06	628549.57	85	26	41056.780	160815.727
80	34	104161.64	503230.51	86	27	32010.309	119758.947
81	35	86242.044	399068.871	87	28	24397.170	87748.638
82	36	70414.894	312826.827	88	29	18053.112	63351.468
83	37	57018.819	242411.933	89	30	13282.017	45298.356
84	38	45609.624	185393.114	90	31	9823.6882	32016.3391
85	39	36132.218	139783.490	91	32	6847.4849	22192.6509
86	40	28042.865	103651.272	92	33	4610.9646	15345.1660
87	41	21260.512	75608.407	93	34	3130.0245	10734.2014
88	42	15651.523	54347.895	94	35	2185.7106	7604.1769
89	43	11462.272	38696.372	95	36	1545.2079	5418.4663
90	44	8439.4012	27234.1003	96	37	1116.3416	3873.2584
91	45	5855.2932	18794.6991	97	38	823.0239	2756.9168
92	46	3924.2073	12939.4059	98	39	602.83954	1933.89293
93	47	2651.0158	9015.1986	99	40	445.74664	1331.05339
94	48	1842.8940	6364.1828	100	41	342.81801	885.30675
95	49	1298.0095	4521.2888	101	42	250.44120	542.48874
96	50	934.78465	3223.27934	102	43	167.91954	292.04754
97	51	687.38499	2288.49469	103	44	94.55481	124.12800
98	52	501.89678	1601.10970	104	45	29.57319	29.57319
99	53	369.85992	1099.21292				

Difference of Age 59 years.

COMMUTATION TABLES FOR JOINT ANNUITIES.

Difference of Age 47 years.

AGES.		$D_{x,y}$	$N_{x,y}$	AGES.		$D_{x,y}$	$N_{x,y}$
(x)	(y)			(x)	(y)		
47	0	4631549.9	42832006.5	101	54	210.03601	453.88147
48	1	3677645.3	38200456.6	102	55	140.46750	243.84546
49	2	3175324.9	34522811.3	103	56	78.82852	103.37796
50	3	2789104.7	31347486.4	104	57	24.54944	24.54944
51	4	2521211.2	28558381.7	Difference of Age 58 years.			
52	5	2298854.1	26037170.5	58	0	2267660.4	17026041.2
53	6	2117720.9	23738316.4	59	1	1783070.4	14758380.8
54	7	1959935.3	21620595.5	60	2	1517137.7	12975310.4
55	8	1818925.8	19660660.2	61	3	1305846.3	11458172.7
56	9	1690069.8	17841734.4	62	4	1153658.2	10152326.4
57	10	1570982.9	16151664.6	63	5	1027243.6	8998668.2
58	11	1458332.4	14580681.7	64	6	924156.61	7971424.57
59	12	1348735.4	13122349.3	65	7	834764.06	7047267.96
60	13	1241950.5	11773613.9	66	8	755643.29	6212503.90
61	14	1137274.7	10531663.4	67	9	684540.11	5456860.61
62	15	1038589.1	9394388.7	68	10	619837.96	4772320.50
63	16	946236.95	8355799.64	69	11	560374.36	4152482.54
64	17	860894.25	7409562.69	70	12	505034.68	3592108.18
65	18	781847.57	6548668.44	71	13	453864.12	3087073.50
66	19	709051.46	5766820.87	72	14	404705.64	2633209.38
67	20	642052.87	5057769.41	73	15	357190.40	2228503.74
68	21	580210.54	4415716.54	74	16	311665.95	1871313.34
69	22	523254.24	3835506.00	75	17	268248.89	1559647.39
70	23	470550.28	3312251.76	76	18	229473.84	1291398.50
71	24	422005.25	2841701.48	77	19	194677.78	1061924.66
72	25	375574.50	2419696.23	78	20	164328.44	867246.88
73	26	330883.04	2044121.73	79	21	138487.64	702918.44
74	27	288369.41	1713238.69	80	22	115468.08	564430.80
75	28	247932.89	1424869.28	81	23	95908.487	448962.718
76	29	211713.39	1176936.39	82	24	78561.633	353054.231
77	30	179092.13	965223.00	83	25	63838.056	274492.598
78	31	150701.86	786130.87	84	26	51247.164	210654.542
79	32	126601.57	635429.01	85	27	40754.271	159407.378
80	33	105219.21	508827.44	86	28	31761.653	118653.107
81	34	87126.66	403608.23	87	29	24184.947	86891.454
82	35	71144.651	316481.569	88	30	17875.686	62706.507
83	36	57626.904	245336.918	89	31	13147.831	44830.821
84	37	46110.154	187710.014	90	32	9723.4285	31682.9899
85	38	36540.253	141599.860	91	33	6778.1183	21959.5614
86	39	28379.932	105059.607	92	34	4564.6191	15181.4431
87	40	21540.647	76679.675	93	35	3098.2447	10616.8240
88	41	15870.137	55139.028	94	36	2163.2909	7518.5793
89	42	11629.415	39268.891	95	37	1528.9027	5355.2884
90	43	8564.2862	27639.4762	96	38	1104.2237	3826.3857
91	44	5943.2403	19075.1900	97	39	813.83341	2722.16197
92	45	3983.1926	13131.9497	98	40	595.67965	1908.32856
93	46	2690.8850	9148.7571	99	41	439.94974	1312.64891
94	47	1870.2052	6457.8721	100	42	338.09563	872.69917
95	48	1316.3529	4587.6669	101	43	246.84175	534.60354
96	49	947.75301	3271.31402	102	44	165.47093	287.76179
97	50	696.73394	2323.56101	103	45	93.15560	122.29086
98	51	509.17405	1626.82707	104	46	29.13526	29.13526
99	52	375.56899	1117.65302				
100	53	288.20256	742.08403				

Difference of Age 58 years.

COMMUTATION TABLES FOR JOINT ANNUITIES.

Difference of Age 48 years.

AGES.		D _{xy}	N _{xy}	AGES.		D _{xy}	N _{xy}
(x)	(y)			(x)	(y)		
48	0	4346584.7	39699965.9	102	54	142.88163	248.17369
49	1	3453711.8	35353381.2	103	55	80.26714	105.29206
50	2	2982739.2	31899669.4	104	56	25.02492	25.02492
51	3	2620647.4	28916930.2	Difference of Age 57 years.			
52	4	2366835.6	26296282.8				
53	5	2156103.8	23929447.2	57	0	2431862.1	18710379.2
54	6	1984308.1	21773343.4	58	1	1918667.5	16278517.1
55	7	1835066.9	19789035.3	59	2	1639345.8	14359849.6
56	8	1701262.4	17953968.4	60	3	1418647.6	12720503.8
57	9	1579008.1	16252706.0	61	4	1256298.1	11301856.2
58	10	1464908.6	14673697.9	62	5	1120522.3	10045558.1
59	11	1355268.4	13208789.3	63	6	1008956.7	8925035.8
60	12	1248191.4	11853520.9	64	7	912805.37	7916079.12
61	13	1143199.0	10605329.5	65	8	827421.58	7003273.75
62	14	1044359.1	9462130.5	66	9	750671.96	6175852.17
63	15	952131.1	8417771.4	67	10	681061.00	5425180.21
64	16	866708.29	7465640.26	68	11	617055.40	4744119.21
65	17	787291.13	6598931.97	69	12	557673.13	4127063.81
66	18	714022.79	5811640.84	70	13	502509.51	3569390.68
67	19	646586.24	5097618.05	71	14	451512.12	3066881.17
68	20	584336.40	4451031.81	72	15	402469.70	2615369.05
69	21	526913.97	3866695.41	73	16	354979.22	2212899.35
70	22	473864.57	3339781.44	74	17	309575.23	1857920.13
71	23	424998.70	2865916.87	75	18	266394.14	1548344.90
72	24	378257.63	2440918.17	76	19	227876.14	1281950.76
73	25	333321.01	2062660.54	77	20	193312.84	1054074.62
74	26	290509.90	1729339.53	78	21	163168.16	860761.78
75	27	249873.91	1438829.63	79	22	137525.76	697593.62
76	28	213571.18	1188955.72	80	23	114660.48	560067.86
77	29	180869.72	975384.54	81	24	95232.962	445407.378
78	30	152239.91	794514.82	82	25	78004.365	350174.416
79	31	127906.98	642274.91	83	26	63371.134	272170.051
80	32	106296.01	514367.93	84	27	50869.571	208798.917
81	33	88011.276	408071.919	85	28	40437.692	157929.346
82	34	71874.408	320060.643	86	29	31485.369	117491.654
83	35	58224.130	248186.235	87	30	23947.257	86006.285
84	36	46601.902	189962.105	88	31	17695.092	62059.028
85	37	36941.253	143360.203	89	32	13013.646	44363.936
86	38	28700.422	106418.950	90	33	9624.9279	31350.2899
87	39	21799.559	77718.528	91	34	6709.9902	21725.3620
88	40	16079.246	55918.969	92	35	4518.2735	15015.3718
89	41	11791.851	39839.723	93	36	3066.4648	10497.0983
90	42	8689.171	28047.872	94	37	2140.4637	7430.6335
91	43	6031.1875	19358.7010	95	38	1512.3063	5290.1698
92	44	4043.0205	13327.5135	96	39	1091.8931	3777.8635
93	45	2731.3321	9284.4930	97	40	804.16755	2685.97040
94	46	1898.3316	6553.1609	98	41	587.93288	1881.80285
95	47	1335.8609	4654.8293	99	42	433.88933	1293.86997
96	48	961.14656	3318.96837	100	43	333.23635	859.98064
97	49	706.39978	2357.82181	101	44	243.24228	526.74429
98	50	516.09920	1651.42203	102	45	163.02232	283.50201
99	51	381.01456	1135.32283	103	46	91.77611	120.47969
100	52	292.65119	754.30827	104	47	28.70358	28.70358
101	53	213.48339	461.65708				

Difference of Age 57 years.

COMMUTATION TABLES FOR JOINT ANNUITIES.

Difference of Age 49 years.

AGES.		D _{x,y}	N _{x,y}	AGES.		D _{x,y}	N _{x,y}
(x)	(y)			(x)	(y)		
49	0	4081919.2	36757645.7	103	54	81.64664	107.12827
50	1	3244241.8	32675726.5	104	55	25.48163	25.48163
51	2	2802586.8	29431484.7	Difference of Age 56 years.			
52	3	2460183.2	26628897.9	56	0	2602910.6	20506097.7
53	4	2219863.8	24168714.7	57	1	2057598.5	17903187.1
54	5	2020273.0	21948850.9	58	2	1764013.0	15845588.6
55	6	1857886.9	19928577.9	59	3	1532922.1	14081575.6
56	7	1716359.2	18070691.0	60	4	1364819.3	12548653.5
57	8	1589465.1	16354331.8	61	5	1220214.1	11183834.2
58	9	1472391.9	14764866.7	62	6	1100574.8	9963620.1
59	10	1361379.8	13292474.8	63	7	996563.88	8863045.28
60	11	1254237.3	11931095.0	64	8	904776.45	7866481.40
61	12	1148943.7	10676857.7	65	9	821978.02	6961704.95
62	13	1049799.3	9527914.0	66	10	746856.75	6139726.93
63	14	957420.72	8478114.67	67	11	678003.61	5392870.18
64	15	872107.05	7520693.95	68	12	614080.95	4714866.57
65	16	792608.10	6648586.90	69	13	554884.77	4100785.62
66	17	718994.13	5855978.80	70	14	499905.42	3545900.85
67	18	651119.62	5136984.67	71	15	449017.58	3045995.43
68	19	588462.26	4485865.05	72	16	399978.22	2596977.85
69	20	530660.84	3897402.79	73	17	352597.95	2196999.63
70	21	477178.86	3366741.95	74	18	307434.74	1844401.68
71	22	427992.15	2889563.09	75	19	264539.39	1536966.94
72	23	380940.76	2461570.94	76	20	226278.44	1272427.55
73	24	335702.28	2080630.18	77	21	191947.91	1046149.11
74	25	292650.39	1744927.90	78	22	162034.86	854201.20
75	26	251728.66	1452277.51	79	23	136563.89	692166.34
76	27	215243.19	1200548.85	80	24	113852.88	555602.45
77	28	182456.85	985305.66	81	25	94557.436	441749.575
78	29	153750.98	802848.81	82	26	77433.828	347192.139
79	30	129212.38	649097.83	83	27	62904.211	269758.311
80	31	107392.05	519885.45	84	28	50474.417	206854.100
81	32	88911.976	412493.398	85	29	40085.938	156379.683
82	33	72604.165	323581.422	86	30	31175.931	116293.745
83	34	58821.357	250977.257	87	31	23705.322	85117.814
84	35	47084.868	192155.900	88	32	17514.497	61412.492
85	36	37335.218	145071.032	89	33	12881.814	43897.995
86	37	29015.387	107735.814	90	34	9528.1861	31016.1813
87	38	22045.738	78720.427	91	35	6641.8623	21487.9952
88	39	16272.514	56674.689	92	36	4471.9279	14846.1329
89	40	11947.223	40402.175	93	37	3034.1072	10374.2050
90	41	8810.538	28454.952	94	38	2117.2288	7340.0978
91	42	6119.1345	19644.4138	95	39	1495.4188	5222.8690
92	43	4102.8485	13525.2793	96	40	1078.9247	3727.4502
93	44	2772.3569	9422.4308	97	41	793.70941	2648.52550
94	45	1926.8657	6650.0739	98	42	579.83398	1854.81609
95	46	1355.9512	4723.2082	99	43	427.65328	1274.98211
96	47	975.39049	3367.25697	100	44	328.37709	847.32883
97	48	716.38256	2391.86648	101	45	239.64283	518.95174
98	49	523.25908	1675.48392	102	46	160.60819	279.30891
99	50	386.19664	1152.22484	103	47	90.41631	118.70072
100	51	296.89449	766.02820	104	48	28.28441	28.28441
101	52	216.77866	469.13371				
102	53	145.22678	252.35505				

Difference of Age 56 years.

COMMUTATION TABLES FOR JOINT ANNUITIES.

Difference of Age 50 years.

AGES.		D _{x,y}	N _{x,y}	AGES.		D _{x,y}	N _{x,y}
(x)	(y)			(x)	(y)		
50	0	3834347.9	33990546.6	104	54	25.91956	25.91956
51	1	3048295.0	30156198.7	Difference of Age 55 years.			
52	2	2630982.3	27107903.7	55	0	2782934.3	22419728.3
53	3	2307414.9	24476921.4	56	1	2202322.6	19636794.0
54	4	2080016.2	22169506.5	57	2	1891745.5	17434471.4
55	5	1891560.4	20089490.3	58	3	1649496.2	15542725.9
56	6	1737703.1	18197929.9	59	4	1474757.9	13893229.7
57	7	1603569.9	16460226.8	60	5	1325618.3	12418471.8
58	8	1482142.8	14856656.9	61	6	1198491.9	11092853.5
59	9	1368334.2	13374514.1	62	7	1087056.6	9894361.6
60	10	1259893.2	12006179.9	63	8	987798.23	8807305.00
61	11	1154508.9	10746286.7	64	9	898823.98	7819506.77
62	12	1055074.7	9591777.8	65	10	817800.41	6920682.79
63	13	962408.08	8536703.08	66	11	743503.98	6102882.38
64	14	876952.09	7574295.00	67	12	674735.36	5359378.40
65	15	797545.29	6697342.91	68	13	611010.54	4684643.04
66	16	723849.86	5899797.62	69	14	552009.26	4073632.50
67	17	655653.00	5175947.76	70	15	497143.51	3521623.24
68	18	592588.11	4520294.76	71	16	446237.95	3024479.73
69	19	534407.71	3927706.65	72	17	397295.09	2578241.78
70	20	480572.06	3393298.94	73	18	350159.99	2180946.69
71	21	430985.60	2912726.88	74	19	305294.24	1830786.70
72	22	383623.89	2481741.28	75	20	262684.63	1525492.46
73	23	338083.55	2098117.39	76	21	224680.75	1262807.83
74	24	294741.11	1760033.84	77	22	190614.71	1038127.08
75	25	253593.41	1465292.73	78	23	160901.56	847512.37
76	26	216840.89	1211709.32	79	24	135602.01	686610.81
77	27	183885.27	994868.43	80	25	113045.27	551008.80
78	28	155100.15	810983.16	81	26	93865.828	437963.527
79	29	130494.89	655883.01	82	27	76863.290	344097.699
80	30	108488.08	525388.12	83	28	62415.571	267234.409
81	31	89828.761	416900.042	84	29	50035.356	204818.838
82	32	73347.189	327071.281	85	30	39691.973	154783.482
83	33	59418.582	253724.092	86	31	30860.966	115031.509
84	34	47567.835	194305.510	87	32	23463.388	84230.543
85	35	37722.148	146737.675	88	33	17337.071	60767.155
86	36	29324.825	109015.527	89	34	12752.337	43430.084
87	37	22287.672	79690.702	90	35	9431.4443	30677.7474
88	38	16456.277	57403.030	91	36	6573.7342	21246.3031
89	39	12090.826	40946.753	92	37	4424.7397	14672.5689
90	40	8926.6281	28855.9266	93	38	3001.1717	10247.8292
91	41	6204.6042	19929.2985	94	39	2093.5862	7246.6575
92	42	4162.6764	13724.6943	95	40	1477.6578	5153.0713
93	43	2813.3818	9562.0179	96	41	1064.8934	3675.4135
94	44	1955.8074	6748.6361	97	42	782.7759	2610.5201
95	45	1376.3327	4792.8287	98	43	571.50034	1827.74420
96	46	990.05962	3416.49597	99	44	421.41721	1256.24386
97	47	726.99915	2426.43635	100	45	323.51782	834.82665
98	48	530.65374	1699.43720	101	46	236.09407	511.30883
99	49	391.55438	1168.78346	102	47	158.22856	275.21476
100	50	300.93248	777.22908	103	48	89.09593	116.98620
101	51	219.92185	476.29660	104	49	27.89027	27.89027
102	52	147.46846	256.37475				
103	53	82.98673	108.90629				

Difference of Age 55 years.

COMMUTATION TABLES FOR JOINT ANNUITIES.

Difference of Age 51 years.

AGES.		D_{xy}	N_{xy}	AGES.		D_{xy}	N_{xy}
(x)	(y)			(x)	(y)		
Difference of Age 54 years.							
51	0	3602759.7	31386761.5	54	0	2972301.0	24457675.8
52	1	2961645.6	27744001.3	55	1	2354640.7	21485374.8
53	2	2467607.9	24922356.2	56	2	2024804.1	19130734.1
54	3	2162051.7	22454748.3	57	3	1768936.5	17105930.0
55	4	1947497.4	20292696.6	58	4	1586908.7	15336993.5
56	5	1769198.3	18345199.2	59	5	1432399.2	13750084.8
57	6	1623511.1	16579000.9	60	6	1302019.7	12317685.6
58	7	1495295.3	14952489.8	61	7	1183771.0	11015665.9
59	8	1377296.0	13457194.5	62	8	1077495.0	9831894.9
60	9	1266329.2	12079798.5	63	9	981299.56	8754399.94
61	10	1159715.0	10813469.3	64	10	894255.80	7773100.38
62	11	1060145.2	9653734.3	65	11	814129.16	6878844.58
63	12	967244.29	8593569.13	66	12	739920.00	6064715.42
64	13	881520.27	7628324.84	67	13	671361.68	5324795.42
65	14	801976.09	6744804.57	68	14	607844.19	4653433.74
66	15	728358.75	5942828.48	69	15	548959.49	4045589.55
67	16	660080.95	5214469.73	70	16	494065.96	3496630.06
68	17	596713.97	4554388.78	71	17	443244.50	3002564.10
69	18	538154.57	3957674.81	72	18	394548.07	2559319.60
70	19	483965.27	3419520.24	73	19	347722.02	2164771.53
71	20	434050.33	2933554.97	74	20	303153.75	1817049.51
72	21	386307.03	2501504.64	75	21	260829.88	1513895.76
73	22	340464.82	2115197.61	76	22	223120.21	1253065.88
74	23	296831.82	1774732.79	77	23	189281.52	1029945.67
75	24	255395.03	1477900.97	78	24	159768.26	840664.15
76	25	218438.58	1222505.94	79	25	134640.13	680895.89
77	26	185250.20	1004067.36	80	26	112218.44	546255.76
78	27	156314.40	818817.16	81	27	93174.218	434037.325
79	28	131639.98	662502.76	82	28	76266.216	340863.107
80	29	109564.89	530862.78	83	29	61871.638	264596.891
81	30	90745.544	421297.890	84	30	49543.608	202725.253
82	31	74103.483	330552.346	85	31	39290.972	153181.645
83	32	60026.666	256448.863	86	32	30546.002	113890.673
84	33	48050.802	196422.197	87	33	23225.698	83344.671
85	34	38109.078	148371.395	88	34	17162.813	60118.973
86	35	29628.738	110262.317	89	35	12622.860	42956.160
87	36	22525.362	80633.579	90	36	9334.7025	30333.3005
88	37	16636.871	58108.217	91	37	6504.3675	20998.5980
89	38	12227.365	41471.346	92	38	4376.7088	14494.2305
90	39	9033.9234	29243.9808	93	39	2967.6584	10117.5217
91	40	6286.3579	20210.0574	94	40	2068.7208	7149.8633
92	41	4220.8191	13923.6995	95	41	1458.4410	5081.1425
93	42	2854.4067	9702.8804	96	42	1050.2243	3622.7015
94	43	1984.7491	6848.4737	97	43	771.52548	2572.47724
95	44	1397.0053	4863.7246	98	44	563.16669	1800.95176
96	45	1004.9413	3466.7193	99	45	415.18115	1237.78507
97	46	737.93267	2461.77798	100	46	318.72699	822.60392
98	47	538.51787	1723.84531	101	47	232.59600	503.87693
99	48	397.08779	1185.32744	102	48	155.91790	271.28093
100	49	305.10734	788.23965	103	49	87.85439	115.36303
101	50	222.91295	483.13231	104	50	27.50864	27.50864
102	51	149.60668	260.21936				
103	52	84.26769	110.61268				
104	53	26.34499	26.34499				

Difference of Age 54 years.

COMMUTATION TABLES FOR JOINT ANNUITIES.

Difference of Age 52 years.

AGES.		D _{x,y}	N _{x,y}	AGES.		D _{x,y}	N _{x,y}
(x)	(y)			(x)	(y)		
Difference of Age 53 years.							
52	0	3382160.0	28934590.9	53	0	3172140.3	26627131.9
53	1	2683947.9	25552430.9	54	1	2514863.9	23454991.6
54	2	2312152.9	22868483.0	55	2	2164844.6	20940127.7
55	3	2024306.4	20556330.1	56	3	1893357.2	18775283.1
56	4	1821516.8	18532023.7	57	4	1701817.1	16881925.9
57	5	1652936.7	16710506.9	58	5	1541328.8	15180108.8
58	6	1513890.1	15057570.2	59	6	1406899.6	13638780.0
59	7	1389619.0	13543680.1	60	7	1286027.2	12231880.4
60	8	1274715.5	12154061.1	61	8	1173358.7	10945853.2
61	9	1165639.3	10879345.6	62	9	1070406.2	9772494.5
62	10	1064966.0	9713706.3	63	10	976312.21	8702088.34
63	11	971929.38	8648740.30	64	11	890241.31	7725776.13
64	12	885950.02	7676810.92	65	12	810204.74	6835534.79
65	13	806153.72	6790860.90	66	13	736220.40	6025330.05
66	14	732405.18	5984707.18	67	14	667882.58	5289109.65
67	15	664192.62	5252302.00	68	15	604485.93	4621227.07
68	16	600743.88	4588109.38	69	16	545561.17	4016741.14
69	17	541901.44	3987365.50	70	17	490751.67	3471179.97
70	18	487358.47	3445464.06	71	18	440179.77	2980428.30
71	19	437115.05	2958105.59	72	19	391801.06	2540248.53
72	20	389054.04	2520990.54	73	20	345284.05	2148447.47
73	21	342846.09	2131936.50	74	21	301013.26	1803163.42
74	22	298922.54	1789090.41	75	22	259018.26	1502150.16
75	23	257206.65	1490167.87	76	23	221559.66	1243131.90
76	24	219999.12	1232961.22	77	24	187948.33	1021572.24
77	25	186615.14	1012962.10	78	25	158634.96	833623.91
78	26	157474.68	826346.96	79	26	133655.35	674988.95
79	27	132670.57	668872.28	80	27	111391.61	541333.60
80	28	110526.32	536201.71	81	28	92450.44	429941.99
81	29	91646.244	425675.390	82	29	75602.801	337491.550
82	30	74859.777	334029.146	83	30	61264.553	261888.749
83	31	60645.610	259169.369	84	31	49043.079	200624.196
84	32	48542.550	198523.759	85	32	38889.972	151581.117
85	33	38496.007	149981.209	86	33	30236.564	112691.145
86	34	29932.651	111485.202	87	34	22992.253	82454.581
87	35	22758.807	81552.551	88	35	16988.555	59462.328
88	36	16814.298	58793.744	89	36	12493.382	42473.773
89	37	12361.551	41979.446	90	37	9236.2018	29980.3906
90	38	9135.9421	29617.8953	91	38	6433.7621	20744.1888
91	39	6361.9179	20481.9532	92	39	4327.8352	14310.4267
92	40	4276.4338	14120.0353	93	40	2932.4117	9982.5915
93	41	2894.2759	9843.6015	94	41	2041.8173	7050.1798
94	42	2013.6908	6949.3256	95	42	1438.3506	5008.3625
95	43	1417.6780	4935.6348	96	43	1035.1300	3570.0119
96	44	1020.0357	3517.9568	97	44	760.27505	2534.88190
97	45	749.02463	2497.92107	98	45	554.83305	1774.60685
98	46	546.61677	1748.89644	99	46	409.03292	1219.77380
99	47	402.97252	1202.27967	100	47	314.00459	810.74088
100	48	309.41909	799.30715	101	48	229.19933	496.73629
101	49	226.00544	489.88806	102	49	153.74518	267.53696
102	50	151.64144	263.88262	103	50	86.65225	113.79178
103	51	85.48953	112.24118	104	51	27.13953	27.13953
104	52	26.75165	26.75165				

Difference of Age 53 years.

COMMUTATION TABLES

FOR

JOINT ANNUITIES.

TABLE XXXIX.

CARLISLE MORTALITY, SIX PER CENT.

CARLISLE 6 PER CENT.
COMMUTATION TABLES FOR JOINT ANNUITIES.

Equal Ages.

AGES.		$D_{x,y}$	$N_{x,y}$	AGES.		$D_{x,y}$	$N_{x,y}$
(x)	(y)			(x)	(y)		
0	0	100000000.	778292083.	54	54	738096.50	6389183.82
1	1	67536341.	678292083.	55	55	672986.31	5651087.32
2	2	53856213.	610755742.	56	56	612338.48	4978101.01
3	3	44425160.	556899529.	57	57	555934.58	4365762.53
4	4	38790414.	512474369.	58	58	502776.03	3809827.95
5	5	34522736.	473683955.	59	59	451632.13	3307051.92
6	6	31419370.	439161219.	60	60	402315.22	2855419.79
7	7	28917239.	407741849.	61	61	354547.38	2453104.57
8	8	26802615.	378824610.	62	62	310968.16	2098557.19
9	9	24953876.	352021995.	63	63	271828.26	1787589.03
10	10	23302708.	327068119.	64	64	237199.30	1515760.77
11	11	21786753.	303765411.	65	65	206327.56	1278561.47
12	12	20355865.	281978658.	66	66	178982.25	1072233.91
13	13	19012090.	261622793.	67	67	154803.26	893251.66
14	14	17750522.	242610703.	68	68	133363.55	738448.40
15	15	16561250.	224860181.	69	69	114397.91	605084.85
16	16	15430982.	208298931.	70	70	97582.914	490686.939
17	17	14362876.	192867949.	71	71	82796.057	393104.025
18	18	13363155.	178505073.	72	72	69186.613	310307.968
19	19	12431814.	165141918.	73	73	56679.757	241121.355
20	20	11564245.	152710104.	74	74	45443.686	184441.598
21	21	10756148.	141145859.	75	75	35488.671	138997.912
22	22	10006841.	130389711.	76	76	27389.209	103509.241
23	23	9308822.	120382870.	77	77	20791.569	76120.032
24	24	8658633.6	111074047.7	78	78	15626.586	55328.463
25	25	8053047.7	102415414.1	79	79	11708.144	39701.877
26	26	7486486.7	94362366.4	80	80	8584.5314	27993.7331
27	27	6959029.4	86875879.7	81	81	6247.0621	19409.2017
28	28	6463523.2	79916850.3	82	82	4421.7588	13162.1396
29	29	5992041.3	73453327.1	83	83	3080.2732	8740.3808
30	30	5542302.2	67461285.8	84	84	2095.1670	5660.1076
31	31	5123473.9	61918983.6	85	85	1398.6900	3564.9406
32	32	4735309.6	56795509.7	86	86	897.48602	2166.25059
33	33	4377222.5	52060200.1	87	87	550.77362	1268.76457
34	34	4046860.6	47682977.6	88	88	319.19773	717.99095
35	35	3740660.8	43636117.0	89	89	183.28845	398.79322
36	36	3456901.7	39895456.2	90	90	106.42626	215.50477
37	37	3192765.5	36438554.5	91	91	54.89652	109.07851
38	38	2947005.9	33245789.0	92	92	26.42304	54.18199
39	39	2718449.6	30298783.1	93	93	12.92236	27.75895
40	40	2504018.2	27580333.5	94	94	6.68911	14.83658
41	41	2301238.3	25076315.3	95	95	3.54965	8.14747
42	42	2111580.1	22775077.0	96	96	1.96831	4.59782
43	43	1935206.6	20663496.9	97	97	1.13730	2.62951
44	44	1772810.9	18728290.3	98	98	.64905	1.49221
45	45	1623331.7	16955479.4	99	99	.37801	.84316
46	46	1486423.9	15332147.7	100	100	.23873	.46515
47	47	1361040.8	13845723.8	101	101	.13624	.22642
48	48	1246773.3	12484683.0	102	102	.06558	.09018
49	49	1143648.9	11237909.7	103	103	.02227	.02461
50	50	1049590.0	10094260.8	104	104	.00233	.00233
51	51	963784.57	9044670.76				
52	52	883426.48	8080886.19				
53	53	808275.89	7197459.71				

Equal Ages.

CONSTRUCTION TIPS FOR NEW ADVERTISERS

செய்துள்ளதில் திரு. : ராஜ

[illegible]

Difference of Age 104 years.

COMMUTATION TABLES FOR JOINT ANNUITIES.

Difference of Age 2 years.

AGES.		D _{x,y}	N _{x,y}	AGES.		D _{x,y}	N _{x,y}
(x)	(y)			(x)	(y)		
2	0	69232823.	648490606.	56	54	634229.57	5316715.65
3	1	51674633.	579257783.	57	55	577044.23	4682486.08
4	2	43119553.	527583150.	58	56	523452.40	4105441.85
5	3	36945474.	484463597.	59	57	472713.92	3581989.45
6	4	32934803.	447518123.	60	58	424291.81	3109275.53
7	5	29807473.	414583320.	61	59	377505.86	2684983.72
8	6	27376722.	384775847.	62	60	333683.95	2307477.86
9	7	25342039.	357399125.	63	61	292872.49	1973793.91
10	8	23576857.	332057086.	64	62	256217.51	1680921.42
11	9	2196794.	308480229.	65	63	223418.98	1424703.91
12	10	20546701.	286483435.	66	64	194381.90	1201284.93
13	11	19200181.	265936734.	67	65	168602.04	1006903.03
14	12	17932650.	246736553.	68	66	145753.07	838300.99
15	13	16740007.	228803903.	69	67	125543.21	692547.92
16	14	15613364.	212063896.	70	68	107621.64	567004.71
17	15	14549946.	196450532.	71	69	91813.81	459383.07
18	16	13547072.	181900586.	72	70	77516.127	367569.260
19	17	12606139.	168353514.	73	71	64626.843	290053.133
20	18	11727550.	155747375.	74	72	52898.327	225426.290
21	19	10909121.	144019825.	75	73	42310.970	172527.963
22	20	10148486.	133110704.	76	74	33282.861	130216.993
23	21	9439954.2	122962217.9	77	75	25626.107	96934.132
24	22	8781471.8	113522263.7	78	76	19517.128	71308.025
25	23	8168110.8	104740791.9	79	77	14719.118	51790.897
26	24	7595525.7	96572681.1	80	78	10926.586	37071.779
27	25	7062339.8	88977155.4	81	79	8068.1889	26145.1935
28	26	6562477.6	81914815.6	82	80	5812.3257	18077.0046
29	27	6091943.7	75352338.0	83	81	4138.3446	12264.6789
30	28	5646429.1	69260394.3	84	82	2871.4482	8126.3343
31	29	5227136.0	63613965.2	85	83	1958.1660	5254.8861
32	30	4832962.5	58386829.2	86	84	1293.6515	3296.7201
33	31	4467614.7	53553866.7	87	85	828.02116	2003.06860
34	32	4129785.0	49086252.0	88	86	504.93780	1175.04744
35	33	3817399.5	44956467.0	89	87	299.74245	670.10964
36	34	3528554.1	41139067.5	90	88	173.87952	370.36719
37	35	3260256.8	37610513.4	91	89	94.63114	196.48767
38	36	3011120.6	34350256.6	92	90	50.02763	101.85653
39	37	2779318.3	31339136.0	93	91	25.12682	51.82890
40	38	2562733.1	28559817.7	94	92	12.54209	26.70208
41	39	2359584.7	25997084.6	95	93	6.38937	14.15999
42	40	2169285.2	23637499.9	96	94	3.42314	7.77063
43	41	1990850.3	21468214.7	97	95	1.89550	4.34749
44	42	1825278.4	19477364.4	98	96	1.06630	2.45198
45	43	1672096.9	17652086.0	99	97	.61856	1.38568
46	44	1531428.4	15979989.1	100	98	.37135	.76711
47	45	1402275.5	14448560.7	101	99	.21409	.39576
48	46	1284278.5	13046285.2	102	100	.11804	.18167
49	47	1176999.0	11762006.7	103	101	.05197	.06364
50	48	1079189.5	10585007.7	104	102	.01167	.01167
51	49	990445.27	9505818.23	Difference of Age 103 years.			
52	50	908425.21	8515372.96	103	0	74.23640	93.98843
53	51	832652.77	7606947.75	104	1	19.75203	19.75203
54	52	761791.13	6774294.98				
55	53	695788.20	6012503.85				

Difference of Age 103 years.

COMMUTATION TABLES FOR JOINT ANNUITIES.

Difference of Age 3 years.

AGES.		D _{x,y}	N _{x,y}	AGES.		D _{x,y}	N _{x,y}
(x)	(y)			(x)	(y)		
3	0	61073907.	600525424.	57	54	586961.52	4831709.94
4	1	46899928.	539451517.	58	55	533005.41	4244748.42
5	2	39510426.	492551589.	59	56	481869.44	3711743.01
6	3	34233747.	453041163.	60	57	433347.49	3229873.57
7	4	30688935.	418807416.	61	58	386870.49	2796526.08
8	5	27872915.	388118481.	62	59	343393.12	2409655.59
9	6	25657181.	360245566.	63	60	303020.31	2066262.47
10	7	23786076.	334588385.	64	61	265726.61	1763242.16
11	8	22142469.	310802309.	65	62	232101.42	1497515.55
12	9	20651661.	288659840.	66	63	202112.65	1265414.13
13	10	19286762.	268008179.	67	64	175585.22	1063301.48
14	11	18019511.	248721417.	68	65	151998.19	887716.26
15	12	16824127.	230701906.	69	66	131115.86	735718.07
16	13	15694696.	213877779.	70	67	112620.68	604602.21
17	14	14630779.	198183083.	71	68	96286.324	491981.530
18	15	13631457.	183552304.	72	69	81519.459	395695.206
19	16	12691274.	169920847.	73	70	68146.267	314175.747
20	17	11809202.	157229573.	74	71	56206.015	246029.480
21	18	10985607.	145420371.	75	72	45404.312	189823.465
22	19	10220142.	134434764.	76	73	36103.136	144419.153
23	20	9507081.3	124214622.3	77	74	28165.768	108316.017
24	21	8842890.9	114707541.0	78	75	21578.344	80150.249
25	22	8225642.4	105864650.1	79	76	16408.729	58571.905
26	23	7649403.8	97639007.7	80	77	12241.740	42163.176
27	24	7112793.6	89989603.9	81	78	9053.8886	29921.4358
28	25	6610830.2	82876810.3	82	79	6592.9949	20868.0472
29	26	6137162.6	76265980.1	83	80	4711.8786	14275.0523
30	27	5690633.9	70128817.5	84	81	3315.0374	9563.1737
31	28	5273004.1	64438183.6	85	82	2278.7646	6248.1363
32	29	4880932.3	59165179.5	86	83	1523.5253	3969.3717
33	30	4513210.8	54284247.2	87	84	984.32178	2445.84645
34	31	4172367.8	49771036.4	88	85	612.25427	1461.52467
35	32	3856466.5	45598668.6	89	86	371.64012	849.27040
36	33	3564380.2	41742202.1	90	87	221.84628	477.63028
37	34	3293698.5	38177821.9	91	88	121.29517	255.78400
38	35	3042326.9	34884123.4	92	89	63.76761	134.48883
39	36	2808958.7	31841796.5	93	90	33.98103	70.72122
40	37	2590857.0	29032837.8	94	91	17.55892	36.74019
41	38	2386231.1	26441980.8	95	92	8.87412	19.18127
42	39	2195359.4	24055749.7	96	93	4.62124	10.30715
43	40	2017082.3	21860390.3	97	94	2.52734	5.68591
44	41	1850773.2	19843308.0	98	95	1.39083	3.15857
45	42	1696479.5	17992534.8	99	96	.79039	1.76774
46	43	1554090.2	16296055.3	100	97	.47745	.97735
47	44	1423337.8	14741965.1	101	98	.27248	.49990
48	45	1303582.7	13318627.3	102	99	.14427	.22742
49	46	1194700.1	12015044.6	103	100	.06681	.08315
50	47	1095182.8	10820344.5	104	101	.01634	.01634
51	48	1004442.1	9725161.7	Difference of Age 102 years.			
52	49	921027.89	8720719.58				
53	50	843977.46	7799691.69	102	0	131.15100	212.12234
54	51	772836.73	6955714.23	103	1	62.81142	80.97134
55	52	706528.23	6182877.50	104	2	18.15992	18.15992
56	53	644639.33	5476349.27				

Difference of Age 102 years.

COMMUTATION TABLES FOR JOINT ANNUITIES.

Difference of Age 4 years.

AGES.		D_{xy}	N_{xy}	AGES.		D_{xy}	N_{xy}
(x)	(y)			(x)	(y)		
4	0	55430715.	558981118.	58	54	542165.82	4378510.90
5	1	42974382.	503550403.	59	55	490663.56	3836345.08
6	2	36610437.	460576021.	60	56	441740.56	3345681.52
7	3	31899302.	423965584.	61	57	395127.49	2903940.96
8	4	28697170.	392066282.	62	58	351911.54	2508813.47
9	5	26122208.	363369112.	63	59	311837.26	2156901.93
10	6	24081869.	337246904.	64	60	274933.84	1845064.67
11	7	22338959.	313165035.	65	61	240715.49	1570130.83
12	8	20788427.	290826076.	66	62	209967.08	1329415.34
13	9	19385286.	270037649.	67	63	182568.41	1119448.26
14	10	18100769.	250652363.	68	64	158293.67	936879.85
15	11	16905619.	232551594.	69	65	136733.82	778586.18
16	12	15773564.	215645975.	70	66	117619.72	641852.36
17	13	14706993.	199872411.	71	67	100758.84	524232.64
18	14	13707187.	185165418.	72	68	85490.504	423473.802
19	15	12770329.	171458231.	73	69	71665.691	337983.298
20	16	11888955.	158687902.	74	70	59266.860	266317.607
21	17	11062094.	146798947.	75	71	48243.405	207050.747
22	18	10291798.	135736853.	76	72	38742.624	158807.342
23	19	9574208.5	125445054.8	77	73	30552.438	120064.718
24	20	8905772.4	115870846.3	78	74	23716.854	89512.280
25	21	8283174.0	106965073.9	79	75	18141.665	65795.426
26	22	7703281.9	98681899.9	80	76	13646.973	47653.761
27	23	7163247.4	90978618.0	81	77	10143.079	34006.788
28	24	6658058.5	83815370.6	82	78	7398.0599	23863.7088
29	25	6182381.6	77157312.1	83	79	5344.7438	16465.6489
30	26	5732874.1	70974930.5	84	80	3774.4691	11120.9051
31	27	5314285.5	65242056.4	85	81	2630.7945	7346.4360
32	28	4923762.6	59927770.9	86	82	1772.9628	4715.6415
33	29	4558006.9	55004008.3	87	83	1159.2296	2942.6787
34	30	4214950.7	50446001.4	88	84	727.82587	1783.44912
35	31	3896231.0	46231050.7	89	85	450.62632	1055.62325
36	32	3600857.8	42334819.7	90	86	275.05941	604.99693
37	33	3327140.1	38733961.9	91	87	154.75590	329.93752
38	34	3073533.2	35406821.8	92	88	81.73528	175.18162
39	35	2838069.9	32333288.6	93	89	43.31385	93.44634
40	36	2618487.6	29495218.7	94	90	23.74635	50.13249
41	37	2412418.1	26876731.1	95	91	12.42377	26.38613
42	38	2220151.2	24464313.0	96	92	6.41839	13.96236
43	39	2041327.0	22244161.8	97	93	3.41191	7.54398
44	40	1875159.5	20202834.8	98	94	1.85444	4.13207
45	41	1720175.2	18327675.3	99	95	1.03094	2.27763
46	42	1576752.0	16607500.1	100	96	.61008	1.24669
47	43	1444400.1	15030748.1	101	97	.35033	.63661
48	44	1323162.6	13586348.0	102	98	.18361	.28628
49	45	1212657.8	12263185.4	103	99	.08166	.10267
50	46	1111653.5	11050527.6	104	100	.02101	.02101
51	47	1019327.7	9938874.1	Difference of Age 101 years.			
52	48	934043.75	8919546.41	101	0	194.62810	380.32447
53	49	855686.04	7985502.66	102	1	110.96687	185.69637
54	50	783347.89	7129416.62	103	2	57.74849	74.72950
55	51	716772.55	6346468.73	104	3	16.98101	16.98101
56	52	654589.83	5629696.18				
57	53	596595.45	4975106.35				

Difference of Age 101 years.

COMMUTATION TABLES FOR JOINT ANNUITIES.

Difference of Age 5 years.

AGES.		$D_{x,y}$	$N_{x,y}$	AGES.		$D_{x,y}$	$N_{x,y}$
(x)	(y)			(x)	(y)		
5	0	50791138.	521614755.	59	54	499096.27	3955896.46
6	1	39820145.	470823617.	60	55	449802.33	3456800.19
7	2	34113922.	431003472.	61	56	402780.32	3006997.86
8	3	29828981.	396889550.	62	57	359422.41	2604217.54
9	4	26894690.	367060569.	63	58	319572.88	2244795.13
10	5	24518344.	340165879.	64	59	282933.56	1925222.25
11	6	22616756.	315647535.	65	60	249056.10	1642288.69
12	7	20972902.	293030779.	66	61	217759.68	1393232.59
13	8	19513665.	272057877.	67	62	189663.32	1175472.91
14	9	18193234.	252544212.	68	63	164589.16	985809.59
15	10	16981854.	234350978.	69	64	142397.08	821220.43
16	11	15849967.	217369124.	70	65	122659.41	678823.35
17	12	14780898.	201519157.	71	66	105231.35	556163.94
18	13	13778590.	186738259.	72	67	89461.552	450932.591
19	14	12841275.	172959669.	73	68	75156.733	361471.039
20	15	11963012.	160118394.	74	69	62327.706	286314.306
21	16	11136802.	148155382.	75	70	50870.625	223986.600
22	17	10363454.	137018580.	76	71	41165.168	173115.975
23	18	9641335.7	126655125.6	77	72	32786.118	131950.807
24	19	8968653.9	117013789.9	78	73	25726.538	99164.689
25	20	8342075.3	108045136.0	79	74	19939.586	73438.151
26	21	7757160.0	99703060.7	80	75	15088.237	53498.565
27	22	7213701.4	91945900.7	81	76	11307.406	38410.328
28	23	6705286.7	84732199.3	82	77	8288.5107	27102.9225
29	24	6226549.1	78026912.6	83	78	5997.3860	18814.4118
30	25	5775114.2	71800363.5	84	79	4281.4283	12817.0258
31	26	5353732.1	66025249.3	85	80	2995.3968	8535.5975
32	27	4962309.7	60671517.2	86	81	2046.8550	5540.2007
33	28	4598003.4	55709207.5	87	82	1349.0232	3493.3457
34	29	4256786.4	51111204.1	88	83	857.15599	2144.32249
35	30	3935995.6	46854417.7	89	84	535.68836	1287.16650
36	31	3637986.8	42918422.1	90	85	333.51891	751.47814
37	32	3361189.8	39280435.3	91	86	191.87641	417.95923
38	33	3104739.4	35919245.5	92	87	104.28294	226.08282
39	34	2867181.0	32814506.1	93	88	55.51831	121.79988
40	35	2645624.7	29947325.1	94	89	30.26824	66.28157
41	36	2438145.6	27301700.4	95	90	16.80167	36.01333
42	37	2244515.6	24863554.8	96	91	8.98574	19.21166
43	38	2064379.4	22619039.2	97	92	4.73876	10.22592
44	39	1897698.4	20554659.8	98	93	2.50350	5.48716
45	40	1742840.8	18656961.4	99	94	1.37459	2.98366
46	41	1598775.5	16914120.6	100	95	.79575	1.60908
47	42	1465462.5	15315345.1	101	96	.44764	.81333
48	43	1342742.5	13849882.6	102	97	.23607	.36568
49	44	1230872.1	12507140.1	103	98	.10393	.12961
50	45	1128362.9	11276268.0	104	99	.02568	.02568
51	46	1034657.6	10147905.1	Difference of Age 100 years.			
52	47	947886.03	9113247.47	100	0	265.25020	602.28364
53	48	867778.50	8165361.44	101	1	164.67483	337.03344
54	49	794215.34	7297582.94	102	2	102.02237	172.35861
55	50	726521.19	6503367.60	103	3	53.99955	70.33624
56	51	664081.09	5776846.41	104	4	16.33669	16.33669
57	52	605804.35	5112765.32				
58	53	551064.51	4506960.97				

Difference of Age 100 years.

COMMUTATION TABLES FOR JOINT ANNUITIES.

Difference of Age 6 years.

AGES.		D _{x,y}	N _{x,y}	AGES.		D _{x,y}	N _{x,y}
(x)	(y)			(x)	(y)		
6	0	47063166.	487641501.	60	54	457532.79	3563329.21
7	1	37104756.	440578335.	61	55	410131.07	3105796.42
8	2	31899869.	403473579.	62	56	366383.70	2695665.35
9	3	27955413.	371573710.	63	57	326393.54	2329281.65
10	4	25243398.	343618297.	64	58	289952.19	2002888.11
11	5	23026677.	318374899.	65	59	256302.86	1712935.92
12	6	21233712.	295348222.	66	60	225304.89	1456633.06
13	7	19686828.	274114510.	67	61	196702.38	1231328.17
14	8	18313719.	254427682.	68	62	170985.37	1034625.79
15	9	17068603.	236113963.	69	63	148060.34	863640.42
16	10	15921441.	219045360.	70	64	127739.73	715580.08
17	11	14852493.	203123919.	71	65	109740.23	587840.35
18	12	13847829.	188271426.	72	66	93432.599	478100.125
19	13	12908167.	174423597.	73	67	78647.774	384667.526
20	14	12029473.	161515430.	74	68	65363.868	306019.752
21	15	11206173.	149485957.	75	69	53497.846	240655.884
22	16	10433444.	138279784.	76	70	43406.925	187158.038
23	17	9708462.9	127846339.8	77	71	34836.206	143751.113
24	18	9031535.4	118137876.9	78	72	27607.397	108914.907
25	19	8400976.7	109106341.5	79	73	21629.197	81307.510
26	20	7812320.8	100705364.8	80	74	16583.549	59678.313
27	21	7264155.3	92893044.0	81	75	12501.588	43094.764
28	22	6752515.0	85628888.7	82	76	9239.9512	30593.1758
29	23	6270716.5	78876373.7	83	77	6719.2476	21353.2246
30	24	5816372.1	72605657.2	84	78	4804.2299	14633.9770
31	25	5393178.7	66789285.1	85	79	3397.7166	9829.7471
32	26	4999143.7	61396106.4	86	80	2330.5291	6432.0305
33	27	4634000.3	56396962.7	87	81	1557.4241	4101.5014
34	28	4294139.7	51762962.4	88	82	997.49292	2544.07728
35	29	3975062.6	47468822.7	89	83	630.87684	1546.58436
36	30	3675115.7	43493760.1	90	84	396.47529	915.70752
37	31	3395847.5	39818644.4	91	85	232.65668	519.23223
38	32	3136513.1	36422796.9	92	86	129.29676	286.57555
39	33	2896292.1	33286283.8	93	87	70.83370	157.27879
40	34	2672761.9	30389991.7	94	88	38.79686	86.44509
41	35	2463413.8	27717229.8	95	89	21.41621	47.64823
42	36	2268452.5	25253816.0	96	90	12.15215	26.23202
43	37	2087034.3	22985363.5	97	91	6.63426	14.07987
44	38	1919128.8	20898329.2	98	92	3.47708	7.44561
45	39	1763789.2	18979200.4	99	93	1.85569	3.96853
46	40	1619841.4	17215411.2	100	94	1.06100	2.11284
47	41	1485931.5	15595569.8	101	95	.58388	1.05184
48	42	1362322.5	14109638.3	102	96	.30165	.46796
49	43	1249086.3	12747315.8	103	97	.13363	.16631
50	44	1145311.0	11498229.5	104	98	.03268	.03268
51	45	1050209.7	10352918.5	Difference of Age 99 years.			
52	46	962141.51	9302708.84	99	0	343.64650	882.69325
53	47	880638.74	8340567.33	100	1	224.42820	539.04675
54	48	805439.12	7459928.59	101	2	151.40121	314.61855
55	49	736600.29	6654489.47	102	3	95.39924	163.21734
56	50	673113.08	5917889.18	103	4	51.95064	67.81810
57	51	614588.22	5244776.10	104	5	15.86746	15.86746
58	52	559570.62	4630187.88				
59	53	507288.05	4070617.26				

Difference of Age 99 years.

COMMUTATION TABLES FOR JOINT ANNUITIES.

Difference of Age 7 years.

AGES.		$D_{x,y}$	$N_{x,y}$	AGES.		$D_{x,y}$	$N_{x,y}$
(x)	(y)			(x)	(y)		
7	0	43853866.	456289100.	61	54	417179.72	3200433.98
8	1	34696592.	412435234.	62	55	373070.20	2783254.26
9	2	29896227.	377738642.	63	56	332715.13	2410184.06
10	3	26238993.	347842415.	64	57	296140.65	2077468.93
11	4	23707619.	321603422.	65	58	262660.87	1781328.28
12	5	21618565.	297895803.	66	59	231860.56	1518667.41
13	6	19931645.	276277238.	67	60	203517.96	1286806.85
14	7	18476234.	256345593.	68	61	177331.22	1083288.89
15	8	17181640.	237869359.	69	62	153814.22	905957.67
16	9	16002774.	220687719.	70	63	132820.06	752143.45
17	10	14919469.	204684945.	71	64	114285.47	619323.39
18	11	13914904.	189765476.	72	65	97435.93	505037.92
19	12	12973032.	175850572.	73	66	82138.817	407601.986
20	13	12092136.	162877540.	74	67	68400.029	325463.169
21	14	11268430.	150785404.	75	68	56103.881	257063.140
22	15	10498434.	139516974.	76	69	45648.682	200959.259
23	16	9774028.9	129018539.7	77	70	36733.302	155310.577
24	17	9094416.8	119244510.8	78	71	29333.665	118577.275
25	18	8459878.0	110150094.0	79	72	23210.501	89243.610
26	19	7867481.6	101690216.0	80	73	17988.782	66033.109
27	20	7315810.4	93822734.4	81	74	13740.551	48044.327
28	21	6799743.3	86506924.0	82	75	10215.788	34303.776
29	22	6314883.8	79707180.7	83	76	7490.5521	24087.9881
30	23	5857629.9	73392296.9	84	77	5382.4802	16597.4360
31	24	5431708.0	67534667.0	85	78	3812.6089	11214.9558
32	25	5035977.7	62102959.0	86	79	2643.5488	7402.3469
33	26	4668397.4	57066981.3	87	80	1773.2678	4758.7981
34	27	4327757.7	52398583.9	88	81	1151.5884	2985.5303
35	28	4009943.8	48070826.2	89	82	734.16647	1833.94194
36	29	3711593.3	44060882.4	90	83	466.92647	1099.77547
37	30	3430505.2	40349289.1	91	84	276.57390	632.84900
38	31	3168854.1	36918783.9	92	85	156.77673	356.27510
39	32	2925932.5	33749929.8	93	86	87.82422	199.49837
40	33	2699899.0	30823997.3	94	87	49.49944	111.67415
41	34	2488681.9	28124098.3	95	88	27.45061	62.17471
42	35	2291962.0	25635416.4	96	89	15.48971	34.72410
43	36	2109291.8	23343454.4	97	90	8.97205	19.23439
44	37	1940189.7	21234162.6	98	91	4.86791	10.26234
45	38	1783707.4	19293972.9	99	92	2.57735	5.39443
46	39	1639311.4	17510265.5	100	93	1.43235	2.81708
47	40	1505510.5	15870954.1	101	94	.77851	1.38473
48	41	1381350.9	14365443.6	102	95	.39345	.60622
49	42	1267300.5	12984092.7	103	96	.17074	.21276
50	43	1162259.2	11716792.2	104	97	.04202	.04202
51	44	1065983.9	10554533.0	Difference of Age 98 years.			
52	45	976603.59	9488549.06	98	0	463.61040	1260.10326
53	46	893882.89	8511945.47	99	1	290.75030	796.49286
54	47	817375.51	7618062.58	100	2	206.33813	505.73356
55	48	747009.84	6800687.07	101	3	141.57248	299.39543
56	49	682451.24	6053677.23	102	4	91.77947	157.82295
57	50	622947.08	5371225.99	103	5	50.45849	66.04348
58	51	567684.12	4748278.91	104	6	15.58499	15.58499
59	52	515118.43	4180594.79				
60	53	465042.38	3665476.36				

Difference of Age 98 years.

COMMUTATION TABLES FOR JOINT ANNUITIES.

Difference of Age 8 years.

AGES.		D_{xy}	N_{xy}	AGES.		D_{xy}	N_{xy}
(x)	(y)			(x)	(y)		
8	0	41007673.	427142310.	62	54	379481.92	2867077.29
9	1	32517287.	386134637.	63	55	338787.18	2487595.37
10	2	28060644.	353617350.	64	56	301876.30	2148808.19
11	3	24642643.	325556706.	65	57	268266.85	1846931.89
12	4	22257866.	300914063.	66	58	237612.24	1578665.04
13	5	20292898.	278656197.	67	59	209439.71	1341052.80
14	6	18705996.	258363299.	68	60	183475.61	1131613.09
15	7	17334109.	239657303.	69	61	159522.78	948137.48
16	8	16108752.	222323194.	70	62	137981.67	788614.70
17	9	14995683.	206214442.	71	63	118830.70	650633.03
18	10	13977652.	191218759.	72	64	101471.55	531802.33
19	11	13035870.	177241107.	73	65	85658.241	430330.785
20	12	12152901.	164205237.	74	66	71436.191	344672.544
21	13	11327129.	152052336.	75	67	58709.914	273236.353
22	14	10556759.	140725207.	76	68	47872.360	214526.439
23	15	9834911.7	130168447.6	77	69	38630.399	166654.079
24	16	9155836.0	120333535.9	78	70	30931.106	128023.680
25	17	8518779.4	111177699.9	79	71	24661.834	97092.574
26	18	7922642.6	102658920.5	80	72	19303.936	72430.740
27	19	7367465.5	94736277.9	81	73	14904.878	53126.804
28	20	6848096.0	87368812.4	82	74	11228.218	38221.926
29	21	6359051.2	80520716.4	83	75	8281.6335	26993.7076
30	22	5898887.7	74161665.2	84	76	6000.3366	18712.0741
31	23	5470237.2	68262777.5	85	77	4271.5050	12711.7375
32	24	5071955.1	62792540.3	86	78	2966.3503	8440.2325
33	25	4702794.4	57720585.2	87	79	2011.4401	5473.8822
34	26	4359881.6	53017790.8	88	80	1311.1872	3462.4421
35	27	4041336.9	48657909.2	89	81	847.58252	2151.25492
36	28	3744162.6	44616572.3	90	82	543.37350	1303.67240
37	29	3464554.9	40872409.7	91	83	325.71935	760.29890
38	30	3201195.1	37407854.8	92	84	186.37053	434.57955
39	31	2956102.2	34206659.7	93	85	106.48986	248.20902
40	32	2727529.6	31250557.5	94	86	61.37262	141.71916
41	33	2513950.1	28523027.9	95	87	35.02319	80.34654
42	34	2315471.5	26009077.8	96	88	19.85421	45.32335
43	35	2131151.8	23693606.3	97	89	11.43621	25.46914
44	36	1960881.1	21562454.5	98	90	6.58327	14.03293
45	37	1803282.1	19601573.4	99	91	3.60829	7.44966
46	38	1657823.9	17798291.3	100	92	1.98938	3.84137
47	39	1523606.3	16140467.4	101	93	1.05099	1.85200
48	40	1399551.9	14616861.1	102	94	.52460	.80101
49	41	1285001.7	13217309.2	103	95	.22271	.27640
50	42	1179207.3	11932307.5	104	96	.05369	.05369
51	43	1081758.2	10753100.2	Difference of Age 97 years.			
52	44	991272.27	9671342.01	97	0	631.83470	1774.65891
53	45	907318.96	8680069.74	98	1	392.26076	1142.82421
54	46	829668.21	7772750.78	99	2	267.32261	750.56345
55	47	758080.33	6943082.57	100	3	192.94299	483.24084
56	48	692095.56	6185002.24	101	4	136.20074	290.29785
57	49	631589.28	5492906.68	102	5	89.14334	154.09711
58	50	575405.05	4861317.40	103	6	49.56021	64.95377
59	51	522587.41	4285912.35	104	7	15.39356	15.39356
60	52	472220.66	3763324.94				
61	53	424026.99	3291104.28				

Difference of Age 97 years.

COMMUTATION TABLES FOR JOINT ANNUITIES.

Difference of Age 9 years.

AGES.		$D_{x,y}$	$N_{x,y}$	AGES.		$D_{x,y}$	$N_{x,y}$
(x)	(y)			(x)	(y)		
9	0	38431967.	399919010.	63	54	344609.70	2561605.26
10	1	30520775.	361487043.	64	55	307385.54	2216995.56
11	2	26353467.	330966268.	65	56	273462.64	1909610.02
12	3	23135713.	304612801.	66	57	242683.60	1636147.38
13	4	20892997.	281477088.	67	58	214635.20	1393463.78
14	5	19045035.	260584091.	68	59	188814.19	1178828.58
15	6	17549668.	241539056.	69	60	165050.13	990014.39
16	7	16251700.	223989388.	70	61	143102.64	824964.26
17	8	15094992.	207737688.	71	62	123448.67	681861.62
18	9	14049055.	192642696.	72	63	105507.16	558412.95
19	10	13094654.	178593641.	73	64	89206.046	452905.794
20	11	12211767.	165498987.	74	65	74497.036	363699.748
21	12	11384049.	153287220.	75	66	61315.948	289202.712
22	13	10611750.	141903171.	76	67	50096.039	227886.764
23	14	9889550.1	131291421.4	77	68	40512.197	177790.725
24	15	9212868.0	121401871.3	78	69	32528.547	137278.528
25	16	8576310.9	112189003.3	79	70	26004.859	104749.981
26	17	7977803.5	103612692.4	80	71	20510.995	78745.122
27	18	7419120.7	95634888.9	81	72	15994.569	58234.127
28	19	6896448.7	88215768.2	82	73	12179.658	42239.558
29	20	6404270.2	81319319.5	83	74	9102.3805	30059.9003
30	21	5940145.6	74915049.3	84	75	6634.0355	20957.5198
31	22	5508766.5	68974903.7	85	76	4761.8322	14323.4843
32	23	5107932.5	63466137.2	86	77	3323.3883	9561.6521
33	24	4736391.5	58358204.7	87	78	2257.0554	6238.2638
34	25	4392005.5	53621813.2	88	79	1487.2964	3981.2084
35	26	4071334.7	49229807.7	89	80	965.04916	2493.91201
36	27	3773474.9	45158473.0	90	81	627.31534	1528.86285
37	28	3494956.4	41384998.1	91	82	379.04740	901.54751
38	29	3232968.8	37890041.7	92	83	219.48742	522.50011
39	30	2986272.0	34657072.9	93	84	126.59131	303.01269
40	31	2755653.5	31670800.9	94	85	74.41639	176.42138
41	32	2539677.6	28915147.4	95	86	43.42402	102.00499
42	33	2338981.0	26375469.8	96	87	25.33124	58.58097
43	34	2153011.8	24036488.8	97	88	14.65856	33.24973
44	35	1981203.0	21883477.0	98	89	8.39135	18.59116
45	36	1822513.5	19902274.0	99	90	4.87978	10.19981
46	37	1676017.2	18079760.5	100	91	2.78513	5.32003
47	38	1540812.1	16403743.3	101	92	1.45971	2.53491
48	39	1416374.1	14862931.2	102	93	.70822	1.07520
49	40	1301933.2	13446557.1	103	94	.29695	.36698
50	41	1195678.0	12144623.9	104	95	.07003	.07003
51	42	1097532.4	10948945.9	Difference of Age 96 years.			
52	43	1005940.9	9851413.5	96	0	855.78510	2470.66830
53	44	920946.97	8845472.59	97	1	534.59534	1614.88320
54	45	842139.07	7924525.62	98	2	360.64253	1080.28786
55	46	769481.29	7082386.55	99	3	249.96847	719.64533
56	47	702352.24	6312905.26	100	4	185.62209	469.67686
57	48	640514.85	5610553.02	101	5	132.28872	284.05477
58	49	583387.69	4970038.17	102	6	87.55641	151.76605
59	50	529694.98	4386650.48	103	7	48.95148	64.20964
60	51	479067.63	3856955.50	104	8	15.25816	15.25816
61	52	430572.17	3377887.87				
62	53	385710.44	2947315.70				

Difference of Age 96 years.

COMMUTATION TABLES FOR JOINT ANNUITIES.

Difference of Age 10 years.

AGES.		D_{xy}	N_{xy}	AGES.		D_{xy}	N_{xy}
(x)	(y)			(x)	(y)		
10	0	36072303.	374414854.	64	54	312668.38	2282117.08
11	1	28663927.	338342551.	65	55	278453.34	1969448.70
12	2	24741918.	309678624.	66	56	247383.90	1690995.36
13	3	21717014.	284936706.	67	57	219216.17	1443611.46
14	4	19608232.	263219692.	68	58	193498.03	1224395.29
15	5	17867749.	243611460.	69	59	169852.58	1030897.26
16	6	16453799.	225743711.	70	60	148061.04	861044.68
17	7	15228944.	209289912.	71	61	128030.27	712983.64
18	8	14142095.	194060968.	72	62	109607.35	584953.37
19	9	13161547.	179918873.	73	63	92753.853	475346.023
20	10	12266834.	166757326.	74	64	77582.567	382592.170
21	11	11439191.	154490492.	75	65	63943.169	305009.603
22	12	10665076.	143051301.	76	66	52319.718	241066.434
23	13	9941066.3	132386225.5	77	67	42393.995	188746.716
24	14	9264050.6	122445159.2	78	68	34113.107	146352.721
25	15	8629733.1	113181108.6	79	69	27347.883	112239.614
26	16	8031681.6	104551375.5	80	70	21627.975	84891.731
27	17	7470775.8	96519693.9	81	71	16994.696	63263.756
28	18	6944801.4	89048918.1	82	72	13070.109	46269.060
29	19	6449489.1	82104116.7	83	73	9873.6848	33198.9506
30	20	5982385.7	75654627.6	84	74	7291.4981	23325.2658
31	21	5547295.7	69672241.9	85	75	5264.7321	16033.7677
32	22	5143909.9	64124946.2	86	76	3704.8810	10769.0356
33	23	4769988.6	58981036.3	87	77	2528.7208.	7064.1546
34	24	4423382.3	54211047.7	88	78	1668.9089	4535.4338
35	25	4101332.5	49787665.4	89	79	1094.6675	2866.5249
36	26	3801484.5	45686332.9	90	80	714.2551	1771.8574
37	27	3522317.7	41884848.4	91	81	437.60369	1057.60231
38	28	3261338.1	38362530.7	92	82	255.42276	619.99862
39	29	3015912.4	35101192.6	93	83	149.08580	364.57586
40	30	2783777.5	32085280.2	94	84	88.46353	215.49006
41	31	2565864.6	29301502.7	95	85	52.65311	127.02653
42	32	2362917.9	26735638.1	96	86	31.40731	74.37342
43	33	2174871.8	24372720.2	97	87	18.70231	42.96611
44	34	2001524.9	22197848.4	98	88	10.75576	24.26380
45	35	1841401.4	20196323.5	99	89	6.22000	13.50804
46	36	1693891.3	18354922.1	100	90	3.76655	7.28804
47	37	1557721.3	16661030.8	101	91	2.04359	3.52148
48	38	1432369.0	15103309.5	102	92	.98363	1.47789
49	39	1317582.1	13670940.5	103	93	.40088	.49426
50	40	1211432.6	12353358.4	104	94	.09338	.09338
51	41	1112862.3	11141925.8	Difference of Age 95 years.			
52	42	1020609.6	10029063.5	95	0	1183.2159	3436.8978
53	43	934575.0	9008453.9	96	1	724.07977	2253.68194
54	44	854788.08	8073878.95	97	2	491.50421	1529.60217
55	45	781047.46	7219090.87	98	3	337.23020	1038.09796
56	46	712915.07	6438043.41	99	4	240.48382	700.86776
57	47	650007.10	5725128.34	100	5	180.29056	460.38394
58	48	591632.07	5075121.24	101	6	129.93373	280.09338
59	49	537043.49	4483489.17	102	7	86.48097	150.15965
60	50	485583.31	3946445.68	103	8	48.52091	63.67868
61	51	436815.25	3460862.37	104	9	15.15777	15.15777
62	52	391664.18	3024047.12				
63	53	350265.86	2632382.94				

Difference of Age 95 years.

COMMUTATION TABLES FOR JOINT ANNUITIES.

Difference of Age 11 years.

AGES.		D_{xy}	N_{xy}	AGES.		D_{xy}	N_{xy}
(x)	(y)			(x)	(y)		
11	0	33877706.	350468137.	65	54	283238.93	2026530.73
12	1	26911090.	316590431.	66	55	251898.66	1743291.80
13	2	23224725.	289679341.	67	56	223461.94	1491393.14
14	3	20381578.	266454616.	68	57	197627.87	1267931.20
15	4	18396132.	246073038.	69	58	174066.04	1070303.33
16	5	16752018.	227676906.	70	59	152369.16	896237.29
17	6	15418324.	210924888.	71	60	132466.42	743868.13
18	7	14267591.	195506564.	72	61	113675.25	611401.71
19	8	13248709.	181238973.	73	62	96358.425	497726.464
20	9	12329498.	167990264.	74	63	80668.096	401368.039
21	10	11490775.	155660766.	75	64	66591.578	320699.943
22	11	10716735.	144169991.	76	65	54561.474	254108.365
23	12	9991021.4	133453256.4	77	66	44275.792	199546.891
24	13	9312308.5	123462235.0	78	67	35697.666	155271.099
25	14	8677676.1	114149926.5	79	68	28680.078	119573.433
26	15	8081711.2	105472250.4	80	69	22744.955	90893.355
27	16	7521229.7	97390539.2	81	70	17920.186	68148.400
28	17	6993154.1	89869309.5	82	71	13887.372	50228.214
29	18	6494708.1	82876155.4	83	72	10595.547	36340.842
30	19	6024625.9	76381447.3	84	73	7909.3545	25745.2953
31	20	5586742.4	70356821.4	85	74	5786.4905	17835.9408
32	21	5179887.3	64770079.0	86	75	4096.1555	12049.4503
33	22	4803585.7	59590191.7	87	76	2818.9933	7953.2948
34	23	4454759.1	54786060.0	88	77	1869.7833	5134.3015
35	24	4130632.8	50331846.9	89	78	1228.3364	3264.5182
36	25	3829494.1	46201214.1	90	79	810.1887	2036.1818
37	26	3548463.0	42371720.0	91	80	498.25127	1225.99311
38	27	3286870.5	38823257.0	92	81	294.88117	727.74184
39	28	3042377.0	35536386.5	93	82	173.49471	432.86067
40	29	2811408.0	32494009.5	94	83	104.18294	259.36596
41	30	2592051.6	29682601.5	95	84	62.59212	155.18302
42	31	2387282.3	27090549.9	96	85	38.08244	92.59090
43	32	2197129.2	24703267.6	97	86	23.18833	54.50847
44	33	2021846.9	22506138.4	98	87	13.72287	31.32013
45	34	1860289.3	20484291.5	99	88	7.97260	17.59727
46	35	1711446.2	18624002.2	100	89	4.80103	9.62467
47	36	1574333.9	16912556.0	101	90	2.76372	4.82364
48	37	1448088.1	15338222.1	102	91	1.37708	2.05992
49	38	1332461.3	13890134.0	103	92	.55677	.68283
50	39	1225993.7	12557672.7	104	93	.12606	.12606
51	40	1127525.7	11331679.0	Difference of Age 94 years.			
52	41	1034865.1	10204153.3				
53	42	948203.02	9169288.24	94	0	1672.2784	4811.1418
54	43	867437.08	8221085.22	95	1	1001.1190	3138.8634
55	44	792778.87	7353648.14	96	2	665.71524	2137.74439
56	45	723630.99	6560869.27	97	3	459.59655	1472.02915
57	46	659782.71	5837238.28	98	4	324.43456	1012.43260
58	47	600399.90	5177455.57	99	5	233.57652	687.99804
59	48	544632.94	4577055.67	100	6	177.08103	454.42152
60	49	492319.86	4032422.73	101	7	128.33776	277.34049
61	50	442756.27	3540102.87	102	8	85.72029	149.00273
62	51	397343.12	3097346.60	103	9	48.20170	63.28244
63	52	355672.48	2700003.48	104	10	15.08074	15.08074
64	53	317800.27	2344331.00				

Difference of Age 94 years.

COMMUTATION TABLES FOR JOINT ANNUITIES.

Difference of Age 12 years.

AGES.		D _{xy}	N _{xy}	AGES.		D _{xy}	N _{xy}
(x)	(y)			(x)	(y)		
12	0	31806039.	327960207.	66	54	256227.87	1793117.16
13	1	25260882.	296154168.	67	55	227540.12	1536889.29
14	2	21796576.	270893286.	68	56	201455.52	1309349.17
15	3	19121672.	249096710.	69	57	177781.14	1107893.65
16	4	17247407.	229975038.	70	58	156148.92	930112.51
17	5	15697775.	212727631.	71	59	136320.78	773963.59
18	6	14445017.	197029856.	72	60	117614.01	637642.81
19	7	13366277.	182584839.	73	61	99934.613	520028.805
20	8	12411150.	169218562.	74	62	83802.995	420094.192
21	9	11549474.	156807412.	75	63	69239.985	336291.197
22	10	10765061.	145257938.	76	64	56821.310	267051.212
23	11	10039415.	134492877.	77	65	46172.889	210229.902
24	12	9359104.	124453462.	78	66	37282.223	164057.013
25	13	8722879.4	115094358.4	79	67	30012.271	126774.790
26	14	8126603.6	106371479.0	80	68	23852.927	96762.519
27	15	7568079.7	98244869.4	81	69	18845.677	72909.592
28	16	7040382.4	90676789.7	82	70	14643.645	54063.915
29	17	6539927.1	83636407.3	83	71	11258.077	39420.270
30	18	6066866.1	77096480.2	84	72	8487.6048	28162.1932
31	19	5626189.0	71029614.1	85	73	6276.8178	19674.5884
32	20	5216721.3	65403425.1	86	74	4502.1029	13397.7706
33	21	4837182.8	60186703.8	87	75	3116.7088	8895.6677
34	22	4486135.9	55349521.0	88	76	2084.4162	5778.9589
35	23	4159933.0	50863385.1	89	77	1376.1824	3694.5427
36	24	3856852.2	46703452.1	90	78	909.1200	2318.3603
37	25	3574608.3	42846599.9	91	79	565.1727	1409.2403
38	26	3311268.1	39271991.6	92	80	335.74881	844.06759
39	27	3066195.2	35960723.5	93	81	200.29665	508.31878
40	28	2836078.1	32894528.3	94	82	121.24018	308.02213
41	29	2617779.1	30058450.2	95	83	73.71435	186.78195
42	30	2411646.7	27440671.1	96	84	45.27103	113.06760
43	31	2219784.2	25029024.4	97	85	28.11664	67.79657
44	32	2042538.3	22809240.2	98	86	17.01450	39.67992
45	33	1879177.3	20766701.9	99	87	10.17194	22.66542
46	34	1729001.1	18887524.6	100	88	6.15380	12.49349
47	35	1590649.7	17158523.5	101	89	3.52277	6.33968
48	36	1463531.4	15567873.8	102	90	1.86234	2.81691
49	37	1347084.0	14104342.4	103	91	.77948	.95457
50	38	1239838.6	12757258.4	104	92	.17509	.17509
51	39	1141078.3	11517419.8	Difference of Age 93 years.			
52	40	1048500.8	10376341.5	93	0	2393.0305	6787.8003
53	41	961447.15	9327840.72	94	1	1414.9148	4394.7698
54	42	880086.09	8366393.57	95	2	920.42364	2979.85504
55	43	804510.28	7486307.48	96	3	622.49808	2059.43140
56	44	734500.01	6681797.20	97	4	442.15792	1436.93332
57	45	669700.00	5947297.19	98	5	315.11599	994.77540
58	46	609429.45	5277597.19	99	6	229.41841	679.65941
59	47	552704.25	4668167.74	100	7	174.90598	450.24100
60	48	499277.27	4115463.49	101	8	127.20892	275.33502
61	49	448898.66	3616186.22	102	9	85.15635	148.12610
62	50	402747.28	3167287.56	103	10	47.95672	62.96975
63	51	360829.56	2764540.28	104	11	15.01303	15.01303
64	52	322705.76	2403710.72				
65	53	287887.80	2081004.96				

Difference of Age 93 years.

COMMUTATION TABLES FOR JOINT ANNUITIES.

Difference of Age 13 years.

AGES.		$D_{x,y}$	$N_{x,y}$	AGES.		$D_{x,y}$	$N_{x,y}$
(x)	(y)			(x)	(y)		
13	0	29855669.	306812516.	67	54	231450.71	1580180.30
14	1	23707524.	276956847.	68	55	205132.08	1348729.59
15	2	20449201.	253249323.	69	56	181244.41	1143597.51
16	3	17927642.	232800122.	70	57	159481.61	962373.10
17	4	16161988.	214872480.	71	58	139702.44	802891.49
18	5	14706827.	198710492.	72	59	121036.22	663189.05
19	6	13532494.	184003665.	73	60	103397.27	542152.83
20	7	12521286.	170471171.	74	61	86913.209	438755.563
21	8	11625960.	157949885.	75	62	71930.768	351842.354
22	9	10820053.	146323925.	76	63	59081.145	279911.586
23	10	10084687.	135503872.	77	64	48085.286	220830.441
24	11	9404437.2	125419184.9	78	65	38879.666	172745.155
25	12	8766713.0	116014747.7	79	66	31344.465	133865.489
26	13	8168942.4	107248034.7	80	67	24960.899	102521.024
27	14	7610124.6	99079092.3	81	68	19763.704	77560.125
28	15	7084237.2	91468967.7	82	69	15399.919	57796.421
29	16	6584094.6	84384730.5	83	70	11871.165	42396.502
30	17	6109106.2	77800635.9	84	71	9018.3276	30525.3375
31	18	5665635.6	71691529.7	85	72	6735.7139	21507.0099
32	19	5253555.3	66025894.1	86	73	4883.5956	14771.2960
33	20	4871579.8	60772338.8	87	74	3425.5887	9887.7004
34	21	4517512.7	55900759.0	88	75	2304.5527	6462.1117
35	22	4189233.2	51383246.3	89	76	1534.1547	4157.5590
36	23	3884210.4	47194013.1	90	77	1018.5442	2623.4043
37	24	3600145.6	43309802.7	91	78	634.1855	1604.8601
38	25	3335665.8	39709657.1	92	79	380.84414	970.67465
39	26	3088954.8	36373991.3	93	80	228.05581	589.83051
40	27	2858281.3	33285036.5	94	81	139.96970	361.77470
41	28	2640750.2	30426755.2	95	82	85.78315	221.80500
42	29	2435583.7	27786005.0	96	83	53.31541	136.02184
43	30	2242439.1	25350421.3	97	84	33.42405	82.70643
44	31	2063599.2	23107982.2	98	85	20.63066	49.28238
45	32	1898408.6	21044383.0	99	86	12.61183	28.65171
46	33	1746556.1	19145974.4	100	87	7.85141	16.03989
47	34	1606965.6	17399418.3	101	88	4.51537	8.18848
48	35	1478699.0	15792452.7	102	89	2.37383	3.67311
49	36	1361450.2	14313753.7	103	90	1.05416	1.29928
50	37	1253444.8	12952303.5	104	91	.24512	.24512
51	38	1153964.3	11698858.7	Difference of Age 92 years.			
52	39	1061103.4	10544894.4	92	0	3523.0725	9720.9407
53	40	974115.45	9483791.01	93	1	2024.7431	6197.8682
54	41	892378.80	8509675.56	94	2	1300.8654	4173.1251
55	42	816241.68	7617296.76	95	3	860.67125	2872.25971
56	43	745369.02	6801055.08	96	4	598.87842	2011.58846
57	44	679758.95	6055686.06	97	5	429.45804	1412.71004
58	45	618589.87	5375927.11	98	6	309.50630	983.25200
59	46	561016.50	4757337.24	99	7	226.60050	673.74570
60	47	506676.42	4196320.74	100	8	173.36753	447.14520
61	48	455242.46	3689644.32	101	9	126.37202	273.77767
62	49	408334.63	3234401.86	102	10	84.72355	147.40565
63	50	365737.11	2826067.23	103	11	47.74143	62.68210
64	51	327384.85	2460330.12	104	12	14.94067	14.94067
65	52	292331.57	2132945.27				
66	53	260433.40	1840613.70				

Difference of Age 92 years.

COMMUTATION TABLES FOR JOINT ANNUITIES.

Difference of Age 14 years.

AGES.		D _{x,y}	N _{x,y}	AGES.		D _{x,y}	N _{x,y}
(x)	(y)			(x)	(y)		
14	0	28019766.	286945279.	68	54	208657.55	1386154.50
15	1	22242022.	258925513.	69	55	184531.75	1177496.95
16	2	19172274.	236683491.	70	56	162570.45	992965.20
17	3	16799414.	217511217.	71	57	142684.11	830394.75
18	4	15141736.	200711803.	72	58	124038.72	687710.64
19	5	13777766.	185570067.	73	59	106405.81	563671.92
20	6	12676995.	171792301.	74	60	89924.687	457266.109
21	7	11729128.	159115306.	75	61	74600.363	367341.422
22	8	10891709.	147386178.	76	62	61377.139	292741.059
23	9	10136203.	136494469.	77	63	49997.681	231363.920
24	10	9446845.6	126358266.5	78	64	40489.990	181366.239
25	11	8809176.8	116911420.9	79	65	32687.490	140876.249
26	12	8209992.3	108102244.1	80	66	26068.871	108188.759
27	13	7649766.9	99892251.8	81	67	20681.731	82119.888
28	14	7123594.1	92242484.9	82	68	16150.093	61438.157
29	15	6625107.1	85118890.8	83	69	12484.253	45288.064
30	16	6150364.1	78493783.7	84	70	9509.4443	32803.8115
31	17	5705082.2	72343419.6	85	71	7156.8925	23294.3672
32	18	5290389.3	66638337.4	86	72	5240.6336	16137.4747
33	19	4905976.9	61347948.1	87	73	3715.8613	10896.8411
34	20	4549636.6	56441971.2	88	74	2532.9441	7180.9798
35	21	4218533.4	51892334.6	89	75	1696.1776	4648.0357
36	22	3911568.6	47673801.2	90	76	1135.4632	2951.8581
37	23	3625682.8	43762232.6	91	77	710.5178	1816.3949
38	24	3359496.0	40136549.8	92	78	427.34869	1105.87711
39	25	3111714.4	36777053.8	93	79	258.68659	678.52842
40	26	2879497.6	33665339.4	94	80	159.36813	419.84183
41	27	2661424.1	30785841.8	95	81	99.03517	260.47370
42	28	2456955.9	28124417.7	96	82	62.04442	161.43853
43	29	2264696.5	25667461.8	97	83	39.36330	99.39411
44	30	2084660.1	23402765.3	98	84	24.52499	60.03081
45	31	1917983.4	21318105.2	99	85	15.29227	35.50582
46	32	1764430.2	19400121.8	100	86	9.73468	20.21355
47	33	1623281.5	17635691.6	101	87	5.76099	10.47887
48	34	1493866.6	16012410.1	102	88	3.04270	4.71788
49	35	1375559.8	14518543.5	103	89	1.34368	1.67517
50	36	1266812.4	13142983.7	104	90	.33150	.33150
51	37	1166628.1	11876171.3	Difference of Age 91 years.			
52	38	1073086.3	10709543.2	91	0	5228.2400	14093.5590
53	39	985824.02	9636456.86	92	1	2980.8716	8865.3190
54	40	904137.04	8650632.84	93	2	1861.5384	5884.4474
55	41	827642.63	7746495.80	94	3	1216.4153	4022.9090
56	42	756238.02	6918853.17	95	4	828.01448	2806.49369
57	43	689817.91	6162615.15	96	5	581.67714	1978.47921
58	44	627881.15	5472797.24	97	6	421.81284	1396.80207
59	45	569449.21	4844916.09	98	7	305.70469	974.98923
60	46	514296.45	4275466.88	99	8	224.60735	669.28454
61	47	461989.03	3761170.43	100	9	172.22696	444.67719
62	48	414105.18	3299181.40	101	10	125.72975	272.45023
63	49	370811.01	2885076.22	102	11	84.34321	146.72048
64	50	331837.52	2514265.21	103	12	47.51130	62.37727
65	51	296570.24	2182427.69	104	13	14.86597	14.86597
66	52	264453.39	1885857.45				
67	53	235249.56	1621404.06				

Difference of Age 91 years.

COMMUTATION TABLES FOR JOINT ANNUITIES.

Difference of Age 15 years.

AGES.		D_{xy}	N_{xy}	AGES.		D_{xy}	N_{xy}
(x)	(y)			x	y		
15	0	26287699.	268282554.	69	54	187703.18	1209676.14
16	1	20853145.	241994855.	70	55	165537.36	1021972.96
17	2	17965719.	221141710.	71	56	145447.62	856435.60
18	3	15738923.	203175091.	72	57	126686.08	710987.98
19	4	14185200.	187437068.	73	58	109045.38	584301.90
20	5	12906761.	173251868.	74	59	92541.216	475256.522
21	6	11874986.	160345107.	75	60	77185.211	382715.306
22	7	10988361.	148470121.	76	61	63655.054	305530.095
23	8	10203331.	137481760.	77	62	51940.675	241875.041
24	9	9495103.5	127278428.7	78	63	42100.315	189934.366
25	10	8848900.9	117783325.2	79	64	34041.346	147834.051
26	11	8249759.4	108934424.3	80	65	27185.851	113792.705
27	12	7688208.0	100684064.9	81	66	21599.758	86606.854
28	13	7160702.0	92996456.9	82	67	16900.267	65007.096
29	14	6661913.2	85835754.9	83	68	13092.397	48106.829
30	15	6188674.9	79173841.7	84	69	10000.561	35014.432
31	16	5743611.5	72985166.8	85	70	7546.6397	25013.8708
32	17	5327223.3	67241555.3	86	71	5568.3261	17467.2311
33	18	4940373.9	61914332.0	87	72	3987.5267	11898.9050
34	19	4581760.4	56973958.1	88	73	2747.5771	7911.3783
35	20	4248531.3	52392197.7	89	74	1864.2764	5163.8012
36	21	3938926.8	48143666.4	90	75	1255.3801	3299.5248
37	22	3651220.1	44204739.6	91	76	792.0783	2044.1447
38	23	3383326.2	40553519.5	92	77	478.78555	1252.06636
39	24	3133944.7	37170193.3	93	78	290.27460	773.28081
40	25	2900713.9	34036248.6	94	79	180.77330	483.00621
41	26	2681179.2	31135534.7	95	80	112.76047	302.23291
42	27	2476191.0	28454355.5	96	81	71.62921	189.47244
43	28	2284569.3	25978164.5	97	82	45.80801	117.84322
44	29	2105351.5	23693595.2	98	83	28.88293	72.03521
45	30	1937558.1	21588243.7	99	84	18.17890	43.15228
46	31	1782623.5	19650685.6	100	85	11.80363	24.97338
47	32	1639894.0	17868062.1	101	86	7.14285	13.16975
48	33	1509034.1	16228168.1	102	87	3.88207	6.02689
49	34	1389669.4	14719134.0	103	88	1.72228	2.14482
50	35	1279941.2	13329464.6	104	89	.42254	.42254
51	36	1179069.8	12049523.4	Difference of Age 90 years.			
52	37	1084862.6	10870453.6	90	0	7494.8070	20330.8171
53	38	996956.77	9785591.04	91	1	4423.6138	12836.0101
54	39	915004.49	8788634.27	92	2	2740.5981	8412.3963
55	40	838547.89	7873629.78	93	3	1740.6904	5671.7982
56	41	766800.86	7035081.89	94	4	1170.2604	3931.1078
57	42	699876.87	6268281.03	95	5	804.23184	2760.84745
58	43	637172.44	5568404.16	96	6	571.32214	1956.61561
59	44	578002.39	4931231.72	97	7	416.63179	1385.29347
60	45	522026.91	4353229.33	98	8	303.01576	968.66168
61	46	468936.99	3831202.42	99	9	223.12967	665.64592
62	47	420242.10	3362265.43	100	10	171.35163	442.51625
63	48	376051.28	2942023.33	101	11	125.16532	271.16462
64	49	336441.14	2565972.05	102	12	83.93664	145.99930
65	50	300603.81	2229530.91	103	13	47.27374	62.06266
66	51	268287.84	1928927.10	104	14	14.78892	14.78892
67	52	238880.82	1660639.26				
68	53	212082.30	1421758.44				

Difference of Age 90 years.

COMMUTATION TABLES FOR JOINT ANNUITIES.

Difference of Age 16 years.

AGES.		D _{x.y}	N _{x.y}	AGES.		D _{x.y}	N _{x.y}
(x)	(y)			(x)	(y)		
16	0	24646194.	250756489.	70	54	168382.35	1049481.65
17	1	19540809.	226110295.	71	55	148102.04	881099.30
18	2	16831603.	206569486.	72	56	129139.74	732997.26
19	3	14744662.	189737883.	73	57	111372.74	603857.52
20	4	13288438.	174993221.	74	58	94836.85	492484.78
21	5	12090216.	161704783.	75	59	79431.06	397647.93
22	6	11125007.	149614567.	76	60	65860.653	318216.871
23	7	10293874.	138489560.	77	61	53868.370	252356.218
24	8	9557985.	128195686.	78	62	43736.403	198487.848
25	9	8894104.3	118637701.2	79	63	35395.202	154751.445
26	10	8286961.0	109743596.9	80	64	28311.838	119356.243
27	11	7725447.8	101456635.9	81	65	22525.249	91044.405
28	12	7196685.4	93731188.1	82	66	17650.441	68519.156
29	13	6696616.2	86534502.7	83	67	13700.541	50868.715
30	14	6223056.4	79837886.5	84	68	10487.717	37168.174
31	15	5779388.7	73614830.1	85	69	7936.3871	26680.4570
32	16	5363200.6	67835441.4	86	70	5871.5639	18744.0699
33	17	4974770.9	62472240.8	87	71	4236.8633	12872.5060
34	18	4613884.3	57497469.9	88	72	2948.4515	8635.6427
35	19	4278529.1	52883585.6	89	73	2022.2489	5687.1912
36	20	3966936.4	48605056.5	90	74	1379.7940	3664.9423
37	21	3676757.3	44638120.1	91	75	875.7302	2285.1483
38	22	3407156.5	40961362.8	92	76	533.74548	1409.41807
39	23	3156175.0	37554206.3	93	77	325.21284	875.67259
40	24	2921436.8	34398031.3	94	78	202.84737	550.45975
41	25	2700934.3	31476594.5	95	79	127.90564	347.61238
42	26	2494571.1	28775660.2	96	80	81.55632	219.70674
43	27	2302454.7	26281089.1	97	81	52.88456	138.15042
44	28	2123826.0	23978634.4	98	82	33.61175	85.26585
45	29	1956789.5	21854808.4	99	83	21.40918	51.65410
46	30	1800816.8	19898018.9	100	84	14.03173	30.24492
47	31	1656803.2	18097202.1	101	85	8.66095	16.21319
48	32	1524477.5	16440398.9	102	86	4.81324	7.55224
49	33	1403779.1	14915921.4	103	87	2.19740	2.73900
50	34	1293070.0	13512142.3	104	88	.54160	.54160
51	35	1191289.3	12219072.3	Difference of Age 89 years.			
52	36	1096432.2	11027783.0	89	0	10126.434	28639.413
53	37	1007897.6	9931350.8	90	1	6341.3562	18512.9793
54	38	925337.49	8923453.24	91	2	4067.0479	12171.6231
55	39	848626.98	7998115.75	92	3	2562.6829	8104.5752
56	40	776904.44	7149488.77	93	4	1674.6427	5541.8923
57	41	709652.48	6372584.33	94	5	1136.6476	3867.2496
58	42	646463.71	5662931.85	95	6	789.91493	2730.60197
59	43	586555.58	5016468.14	96	7	564.30469	1940.68704
60	44	529867.80	4429912.56	97	8	412.96715	1376.38235
61	45	475985.65	3900044.76	98	9	301.02223	963.41520
62	46	426562.22	3424059.11	99	10	221.99564	662.39297
63	47	381624.26	2997496.89	100	11	170.58241	440.39733
64	48	341195.69	2615872.63	101	12	124.56198	269.81492
65	49	304774.12	2274676.94	102	13	83.51696	145.25294
66	50	271936.75	1969902.82	103	14	47.02876	61.73598
67	51	242344.48	1697966.07	104	15	14.70722	14.70722
68	52	215355.95	1455621.59				
69	53	190783.99	1240265.64				

Difference of Age 89 years.

COMMUTATION TABLES FOR JOINT ANNUITIES.

Difference of Age 17 years.

AGES.		D _{x,y}	N _{x,y}	AGES.		D _{x,y}	N _{x,y}
(x)	(y)			(x)	(y)		
17	0	23095153.	234311887.	71	54	150647.37	904468.14
18	1	18307263.	211216734.	72	55	131496.54	753820.77
19	2	15768315.	192909471.	73	56	113529.81	622324.23
20	3	13812532.	177141156.	74	57	96860.958	508794.417
21	4	12447746.	163328624.	75	58	81401.477	411933.459
22	5	11326644.	150880878.	76	59	67776.993	330531.982
23	6	10421884.	139554234.	77	60	55734.870	262754.989
24	7	9642801.8	129132349.9	78	61	45359.610	207020.119
25	8	8953005.6	119489548.1	79	62	36770.718	161660.509
26	9	8329293.7	110536542.5	80	63	29437.826	124889.791
27	10	7760284.9	102207248.8	81	64	23458.203	95451.965
28	11	7231544.4	94446963.9	82	65	18406.715	71993.762
29	12	6730267.5	87215419.5	83	66	14308.685	53587.047
30	13	6255473.3	80485152.0	84	67	10974.873	39278.362
31	14	5811496.4	74229678.7	85	68	8322.9913	28303.4891
32	15	5396608.2	68418182.3	86	69	6174.8016	19980.4978
33	16	5008368.0	63021574.1	87	70	4467.5928	13805.6962
34	17	4646008.2	58013206.1	88	71	3132.8158	9338.1034
35	18	4308526.9	53367197.9	89	72	2170.0947	6205.2876
36	19	3994945.9	49058671.0	90	73	1496.7130	4035.1929
37	20	3702902.6	45063725.1	91	74	962.5190	2538.4799
38	21	3430946.7	41360822.5	92	75	590.11465	1575.96088
39	22	3178405.4	37929835.8	93	76	362.54412	985.84623
40	23	2942159.7	34751430.4	94	77	227.26263	623.30211
41	24	2720230.0	31809270.7	95	78	143.52409	396.03948
42	25	2512951.3	29089040.7	96	79	92.51037	252.51539
43	26	2319545.3	26576089.4	97	80	60.21385	160.00502
44	27	2140453.0	24256544.1	98	81	38.80419	99.79117
45	28	1973960.3	22116091.1	99	82	24.91437	60.98698
46	29	1818690.9	20142130.8	100	83	16.52509	36.07261
47	30	1673712.4	18323439.9	101	84	10.29583	19.54753
48	31	1540196.6	16649727.5	102	85	5.83622	9.25170
49	32	1418145.2	15109530.9	103	86	2.72447	3.41548
50	33	1306198.8	13691385.7	104	87	.69101	.69101
51	34	1203508.8	12385186.9	Difference of Age 88 years.			
52	35	1107795.3	11181678.1	88	0	13758.523	39876.597
53	36	1018646.4	10073882.8	89	1	8567.9758	26118.0738
54	37	935492.33	9055236.38	90	2	5830.2103	17550.0980
55	38	858210.38	8119744.05	91	3	3803.0218	11719.8877
56	39	786242.61	7261533.67	92	4	2465.4461	7916.8659
57	40	719003.06	6475291.06	93	5	1626.5428	5451.4198
58	41	655493.27	5756288.00	94	6	1116.4131	3824.8770
59	42	595108.75	5100794.73	95	7	780.21256	2708.46392
60	43	537708.70	4505685.98	96	8	559.34114	1928.25136
61	44	483135.00	3967977.28	97	9	410.25027	1368.91022
62	45	432973.94	3484842.28	98	10	299.49232	958.65995
63	46	387363.59	3051868.34	99	11	220.99906	659.16763
64	47	346252.12	2664504.75	100	12	169.76013	438.16857
65	48	309081.15	2318252.63	101	13	123.93917	268.40844
66	49	275709.36	2009171.48	102	14	83.08416	144.46927
67	50	245640.54	1733462.12	103	15	46.76893	61.38511
68	51	218478.51	1487821.58	104	16	14.61618	14.61618
69	52	193728.89	1269343.07				
70	53	171146.04	1075614.18				

Difference of Age 88 years.

COMMUTATION TABLES FOR JOINT ANNUITIES.

Difference of Age 18 years.

AGES.		D _{x,y}	N _{x,y}	AGES.		D _{x,y}	N _{x,y}
(x)	(y)			(x)	(y)		
18	0	21637233.	218892988.	72	54	133756.48	773535.49
19	1	17150754.	197255755.	73	55	115601.73	639779.01
20	2	14771472.	180105001.	74	56	98736.96	524177.28
21	3	12938683.	165333529.	75	57	83138.831	425440.319
22	4	11661594.	152394846.	76	58	69458.311	342301.488
23	5	10610777.	140733252.	77	59	57356.582	272843.177
24	6	9762715.4	130122474.9	78	60	46931.287	215486.595
25	7	9032453.9	120359759.5	79	61	38135.405	168555.308
26	8	8384454.6	111327305.6	80	62	30581.830	130419.903
27	9	7799927.2	102942851.0	81	63	24391.158	99838.073
28	10	7264154.3	95142923.8	82	64	19169.087	75446.915
29	11	6762867.2	87878769.5	83	65	14921.773	56277.828
30	12	6286907.8	81115902.3	84	66	11462.029	41356.055
31	13	5841769.4	74828994.5	85	67	8709.5955	29894.0257
32	14	5426589.4	68987225.1	86	68	6475.5939	21184.4302
33	15	5039565.4	63560635.7	87	69	4698.3222	14708.8363
34	16	4677385.0	58521070.3	88	70	3303.4214	10010.5141
35	17	4338524.8	53843685.3	89	71	2305.7890	6707.0927
36	18	4022955.5	49505160.5	90	72	1606.1371	4401.3037
37	19	3729047.9	45482205.0	91	73	1044.0796	2795.1666
38	20	3455384.3	41753157.1	92	74	648.59765	1751.08696
39	21	3200635.7	38297772.8	93	75	400.83261	1102.48931
40	22	2962882.6	35097137.1	94	76	253.35018	701.65670
41	23	2739525.6	32134254.5	95	77	160.79304	448.30652
42	24	2530904.0	29394728.9	96	78	103.80674	287.50748
43	25	2336635.8	26863824.9	97	79	68.30133	183.70074
44	26	2156341.1	24527189.1	98	80	44.18207	115.39941
45	27	1989414.1	22370848.0	99	81	28.76321	71.21734
46	28	1834649.9	20381433.9	100	82	19.23064	42.45413
47	29	1690324.9	18546784.0	101	83	12.12533	23.22349
48	30	1555915.7	16856459.1	102	84	6.93789	11.09816
49	31	1432767.9	15300543.4	103	85	3.30352	4.16027
50	32	1319566.4	13867775.5	104	86	.85675	.85675
51	33	1215728.2	12548209.1	Difference of Age 87 years.			
52	34	1119158.4	11332480.9	87	0	18607.217	55022.110
53	35	1029203.4	10213322.5	88	1	11641.086	36414.893
54	36	945469.01	9184119.15	89	2	7877.353	24773.807
55	37	867628.56	8238650.14	90	3	5451.7225	16896.4538
56	38	795121.52	7371021.58	91	4	3658.7224	11444.7313
57	39	727645.26	6575900.06	92	5	2394.6324	7786.0089
58	40	664130.24	5848254.80	93	6	1597.5872	5391.3765
59	41	603421.01	5184124.56	94	7	1102.7004	3793.7893
60	42	545549.60	4580703.55	95	8	773.34991	2691.08890
61	43	490284.34	4035153.95	96	9	555.66127	1917.73899
62	44	439477.25	3544869.61	97	10	408.16522	1362.07772
63	45	393186.11	3105392.36	98	11	298.14785	953.91250
64	46	351459.48	2712206.25	99	12	219.93376	655.76465
65	47	313661.65	2360746.77	100	13	168.91133	435.83089
66	48	279605.65	2047085.12	101	14	123.29689	266.91956
67	49	249048.34	1767479.47	102	15	82.62513	143.62267
68	50	221449.98	1518431.13	103	16	46.47941	60.99754
69	51	196537.87	1296981.15	104	17	14.51813	14.51813
70	52	173787.81	1100443.28				
71	53	153119.98	926655.47				

Difference of Age 87 years.

COMMUTATION TABLES FOR JOINT ANNUITIES.

Difference of Age 19 years.

AGES.		D_{xy}	N_{xy}	AGES.		D_{xy}	N_{xy}
(x)	(y)			(x)	(y)		
19	0	20270363.	204439799.	73	54	117588.50	656291.40
20	1	16066515.	184163436.	74	55	100538.91	538702.90
21	2	13836956.	168102921.	75	56	84749.064	438163.992
22	3	12121525.	154265965.	76	57	70940.764	353414.928
23	4	10924557.	142144440.	77	58	58779.403	282474.164
24	5	9939660.9	131219882.6	78	59	48296.841	223694.761
25	6	9144777.4	121280221.7	79	60	39456.769	175397.920
26	7	8458857.6	112135444.3	80	61	31716.826	135941.151
27	8	7851582.4	103676586.7	81	62	25339.039	104224.325
28	9	7301262.2	95825004.3	82	63	19931.459	78885.286
29	10	6793363.8	88523742.1	83	64	15539.805	58953.827
30	11	6317360.0	81730378.3	84	65	11953.146	43414.022
31	12	5871125.0	75413018.3	85	66	9096.1997	31460.8758
32	13	5454857.3	69541893.3	86	67	6776.3863	22364.6761
33	14	5067562.9	64087036.0	87	68	4927.1911	15588.2898
34	15	4706520.6	59019473.1	88	69	3474.0270	10661.0987
35	16	4367825.0	54312952.5	89	70	2431.3568	7187.0717
36	17	4050965.1	49945127.5	90	71	1706.5675	4755.7149
37	18	3755193.2	45894162.4	91	72	1120.4119	3049.1474
38	19	3479782.0	42138969.2	92	73	703.55757	1928.73549
39	20	3223395.3	38659187.2	93	74	440.55691	1225.17792
40	21	2983605.5	35435791.9	94	75	280.10663	784.62101
41	22	2758821.3	32452186.4	95	76	179.25721	504.51438
42	23	2548856.7	29693365.1	96	77	116.30120	325.25717
43	24	2353328.9	27144508.4	97	78	76.64154	206.95597
44	25	2172229.1	24791179.5	98	79	50.11628	132.31443
45	26	2004181.0	22618950.4	99	80	32.74951	82.19815
46	27	1849013.0	20614769.4	100	81	22.20144	49.44863
47	28	1705157.5	18765756.4	101	82	14.11054	27.24719
48	29	1571359.0	17060598.9	102	83	8.17071	13.13666
49	30	1447390.6	15489239.9	103	84	3.92711	4.96595
50	31	1333172.6	14041849.3	104	85	1.03884	1.03884
51	32	1228169.9	12708676.7	Difference of Age 86 years.			
52	33	1130521.4	11480506.8	86	0	24454.660	74764.746
53	34	1039760.3	10349985.4	87	1	15743.566	50310.086
54	35	955267.53	9310225.12	88	2	10702.755	34566.520
55	36	876881.50	8354957.59	89	3	7365.9681	23863.7651
56	37	803847.33	7478076.09	90	4	5244.8659	16497.7970
57	38	735862.44	6674228.76	91	5	3553.6348	11252.9311
58	39	672112.88	5938366.32	92	6	2352.0032	7699.2963
59	40	611371.86	5266253.44	93	7	1577.9643	5347.2931
60	41	553169.62	4654881.58	94	8	1093.0012	3769.3288
61	42	497433.69	4101711.96	95	9	768.26208	2676.32762
62	43	445980.56	3604278.27	96	10	552.83717	1908.06554
63	44	399091.80	3158297.71	97	11	406.33289	1355.22837
64	45	356742.32	2759205.91	98	12	296.71066	948.89548
65	46	318378.88	2402463.59	99	13	218.83409	652.18482
66	47	283749.33	2084084.71	100	14	168.03601	433.35073
67	48	252567.86	1800335.38	101	15	122.61570	265.31472
68	49	224522.18	1547767.52	102	16	82.11365	142.69902
69	50	199210.93	1323245.34	103	17	46.16762	60.58537
70	51	176307.65	1124034.41	104	18	14.41775	14.41775
71	52	155483.50	947726.76				
72	53	135951.86	792243.26				

Difference of Age 86 years.

COMMUTATION TABLES FOR JOINT ANNUITIES.

Difference of Age 20 years.

AGES.		D _{x,y}	N _{x,y}	AGES.		D _{x,y}	N _{x,y}
(x)	(y)			(x)	(y)		
20	0	18988908.	190892385.	74	54	102266.81	552432.44
21	1	15050069.	171903477.	75	55	86295.735	450165.628
22	2	12963066.	156853408.	76	56	72314.744	363869.893
23	3	11355420.	143890342.	77	57	60033.935	291555.149
24	4	10233595.	132534922.	78	58	49494.922	231521.214
25	5	9310523.1	122301327.5	79	59	40604.838	182026.292
26	6	8564048.3	112990804.4	80	60	32815.790	141421.454
27	7	7921256.7	104426756.1	81	61	26279.457	108605.664
28	8	7349615.0	96505499.4	82	62	20706.029	82326.207
29	9	6828066.7	89155884.4	83	63	16157.838	61620.178
30	10	6345847.6	82327817.7	84	64	12448.223	45462.340
31	11	5899563.2	75981970.1	85	65	9485.947	33014.117
32	12	5482268.7	70082406.9	86	66	7077.1786	23528.1700
33	13	5093960.7	64600138.2	87	67	5156.0598	16450.9914
34	14	4732667.9	59506177.5	88	68	3643.2569	11294.9316
35	15	4395032.3	54773509.6	89	69	2556.9246	7651.6747
36	16	4078323.2	50378477.3	90	70	1799.5032	5094.7501
37	17	3781338.5	46300154.1	91	71	1190.4703	3295.2469
38	18	3504179.6	42518815.6	92	72	754.99443	2104.77664
39	19	3246154.9	39014636.0	93	73	477.88818	1349.78221
40	20	3004821.8	35768481.1	94	74	307.86645	871.89403
41	21	2778117.0	32763659.3	95	75	198.18866	564.02758
42	22	2566809.4	29985542.3	96	76	129.65144	365.83892
43	23	2370022.0	27418732.9	97	77	85.86633	236.18748
44	24	2187747.7	25048710.9	98	78	56.23594	150.32115
45	25	2018947.9	22860963.2	99	79	37.14818	94.08521
46	26	1862737.8	20842015.3	100	80	25.27834	56.93703
47	27	1718506.9	18979277.5	101	81	16.29037	31.65869
48	28	1585147.7	17260770.6	102	82	9.50845	15.36831
49	29	1461756.8	15675622.9	103	83	4.62493	5.85987
50	30	1346778.9	14213866.1	104	84	1.23494	1.23494
51	31	1240833.7	12867087.2	Difference of Age 85 years.			
52	32	1142091.1	11626253.5	85	0	31431.236	99911.616
53	33	1050317.2	10484162.4	86	1	20691.088	68480.380
54	34	965066.07	9433845.16	87	2	14474.554	47789.292
55	35	885969.21	8468779.09	88	3	10007.950	33314.738
56	36	812420.08	7582809.88	89	4	7086.4785	23306.7881
57	37	743937.95	6770389.80	90	5	5094.2204	16220.3096
58	38	679702.94	6026451.85	91	6	3490.3730	11126.0892
59	39	618720.36	5346748.91	92	7	2323.1140	7635.7162
60	40	560458.34	4728028.55	93	8	1564.0847	5312.6022
61	41	504381.66	4167570.21	94	9	1085.8104	3748.5175
62	42	452483.87	3663188.55	95	10	764.35748	2662.70708
63	43	404997.49	3210704.68	96	11	550.35540	1898.34960
64	44	362100.62	2805707.19	97	12	404.37421	1347.99420
65	45	323164.48	2443606.57	98	13	295.22710	943.61999
66	46	288016.71	2120442.09	99	14	217.70005	648.39289
67	47	256310.85	1832425.38	100	15	167.10763	430.69284
68	48	227695.10	1576114.53	101	16	121.85665	263.58521
69	49	201974.60	1348419.43	102	17	81.56281	141.72856
70	50	178705.57	1146444.83	103	18	45.84839	60.16575
71	51	157737.94	967739.26	104	19	14.31736	14.31736
72	52	138050.38	810001.32				
73	53	119518.50	671950.94				

Difference of Age 85 years.

COMMUTATION TABLES FOR JOINT ANNUITIES.

Difference of Age 21 years.

AGES.		D_{xy}	N_{xy}	AGES.		D_{xy}	N_{xy}
(x)	(y)			(x)	(y)		
21	0	17787577.	178194519.	75	54	87778.844	461499.107
22	1	14099563.	160406942.	76	55	73634.488	373720.263
23	2	12143774.	146307379.	77	56	61196.672	300085.775
24	3	10637207.	134163605.	78	57	50551.295	238889.103
25	4	9585852.7	123526398.4	79	58	41612.107	188337.808
26	5	8719268.4	113940545.7	80	59	33770.628	146725.701
27	6	8019762.0	105221277.3	81	60	27190.020	112955.073
28	7	7414834.9	97201515.3	82	61	21474.500	85765.053
29	8	6873285.6	89786680.4	83	62	16785.759	64290.553
30	9	6378264.5	82913394.8	84	63	12943.300	47504.794
31	10	5926166.8	76535130.3	85	64	9878.8375	34561.4936
32	11	5508823.4	70608963.5	86	65	7380.4164	24682.6561
33	12	5119558.5	65100140.1	87	66	5384.9287	17302.2397
34	13	4757321.1	59980581.6	88	67	3812.4868	11917.3110
35	14	4419449.2	55223260.5	89	68	2681.4796	8104.8242
36	15	4103727.3	50803811.3	90	69	1892.4387	5423.3446
37	16	3806875.8	46700084.0	91	70	1255.3004	3530.9059
38	17	3528577.2	42893208.2	92	71	802.20361	2275.60548
39	18	3268914.5	39364631.0	93	72	512.82643	1473.40187
40	19	3026038.1	36095716.5	94	73	333.95400	960.57544
41	20	2797872.1	33069678.4	95	74	217.83004	626.62144
42	21	2584762.1	30271806.3	96	75	143.34401	408.79140
43	22	2386715.1	27687044.2	97	76	95.72295	265.44739
44	23	2203266.2	25300329.1	98	77	63.00465	169.72444
45	24	2033371.5	23097062.9	99	78	41.68432	106.71979
46	25	1876462.6	21063691.4	100	79	28.67355	65.03547
47	26	1731262.9	19187228.8	101	80	18.54806	36.36192
48	27	1597557.5	17455965.9	102	81	10.97734	17.81386
49	28	1474583.7	15858408.4	103	82	5.38214	6.83652
50	29	1360146.4	14383824.7	104	83	1.45438	1.45438
51	30	1253497.6	13023678.3	Difference of Age 84 years.			
52	31	1153867.4	11770180.7	84	0	39606.182	131306.307
53	32	1061066.0	10616313.3	85	1	26593.969	91700.125
54	33	974864.6	9555247.3	86	2	19023.280	65106.156
55	34	895056.92	8580382.75	87	3	13534.890	46082.876
56	35	820839.74	7685325.83	88	4	9628.2144	32547.9857
57	36	751871.77	6864486.09	89	5	6882.9372	22919.7713
58	37	687162.13	6112614.32	90	6	5003.5331	16036.8341
59	38	625707.47	5425452.19	91	7	3447.5015	11033.3010
60	39	567194.87	4799744.72	92	8	2302.6802	7585.7995
61	40	511027.54	4232549.85	93	9	1553.7947	5283.1193
62	41	458803.99	3721522.31	94	10	1080.2918	3729.3246
63	42	410903.19	3262718.32	95	11	760.92615	2649.03282
64	43	367458.93	2851815.13	96	12	547.70246	1888.10667
65	44	328018.44	2484356.20	97	13	402.35234	1340.40421
66	45	292345.92	2156337.76	98	14	293.69719	938.05187
67	46	260165.57	1863991.84	99	15	216.49729	644.35468
68	47	231069.48	1603826.27	100	16	166.07315	427.85739
69	48	204828.89	1372756.79	101	17	121.03922	261.78424
70	49	181184.77	1167927.90	102	18	80.99886	140.74502
71	50	159883.29	986743.13	103	19	45.52918	59.74616
72	51	140052.04	826859.84	104	20	14.21698	14.21698
73	52	121363.36	686807.80				
74	53	103945.33	565444.44				

Difference of Age 84 years.

COMMUTATION TABLES FOR JOINT ANNUITIES.

Difference of Age 22 years.

AGES.		D _{x,y}	N _{x,y}	AGES.		D _{x,y}	N _{x,y}
(x)	(y)			(x)	(y)		
22	0	16664181.	166293620.	76	54	74899.996	383012.625
23	1	13208442.	149629439.	77	55	62313.512	308112.629
24	2	11375698.	136420997.	78	56	51530.372	245799.117
25	3	9963917.2	125045298.7	79	57	42500.235	194268.745
26	4	8977113.5	115081381.5	80	58	34608.362	151768.510
27	5	8165117.1	106104268.0	81	59	27981.166	117160.148
28	6	7507042.5	97939150.9	82	60	22218.576	89178.982
29	7	6934278.7	90432108.4	83	61	17408.735	66960.406
30	8	6420504.6	83497829.7	84	62	13446.299	49551.671
31	9	5956439.8	77077325.1	85	63	10271.728	36105.372
32	10	5533664.9	71120885.3	86	64	7686.0996	25833.6444
33	11	5144356.3	65587220.4	87	65	5615.6581	18147.5448
34	12	4781227.3	60442864.1	88	66	3981.7165	12531.8867
35	13	4442470.8	55661636.8	89	67	2806.0348	8550.1702
36	14	4126525.7	51219166.0	90	68	1984.6248	5744.1354
37	15	3830588.9	47092640.3	91	69	1320.1306	3759.5106
38	16	3552407.4	43262051.4	92	70	845.88971	2439.38001
39	17	3291674.1	39709644.0	93	71	544.89304	1593.49030
40	18	3047254.5	36417969.9	94	72	358.36925	1048.59726
41	19	2817627.1	33370715.4	95	73	236.28821	690.22801
42	20	2603142.2	30553088.3	96	74	157.55004	453.93980
43	21	2403408.2	27949946.1	97	75	105.83231	296.38976
44	22	2218784.8	25546537.9	98	76	70.23698	190.55745
45	23	2047795.0	23327753.1	99	77	46.70155	120.32047
46	24	1889868.1	21279958.1	100	78	32.17485	73.61892
47	25	1744019.0	19390090.0	101	79	21.03929	41.44407
48	26	1609415.8	17646071.0	102	80	12.49869	20.40478
49	27	1486127.9	16036655.2	103	81	6.21359	7.90609
50	28	1372081.9	14550527.3	104	82	1.69250	1.69250
51	29	1265939.2	13178445.6	Difference of Age 83 years.			
52	30	1165643.6	11912506.4	83	0	49442.588	170228.230
53	31	1072006.8	10746862.8	84	1	33510.791	120785.642
54	32	984841.28	9674856.00	85	2	24450.358	87274.851
55	33	904144.63	8690014.72	86	3	17788.320	62824.493
56	34	829259.39	7785870.09	87	4	13021.330	45036.173
57	35	759663.92	6956610.70	88	5	9351.6681	32014.8435
58	36	694490.47	6196946.78	89	6	6760.4073	22663.1754
59	37	632574.11	5502456.31	90	7	4942.0757	15902.7681
60	38	573600.11	4869882.20	91	8	3417.1776	10960.6924
61	39	517169.93	4296282.09	92	9	2287.5310	7543.5148
62	40	464849.32	3779112.16	93	10	1545.8977	5255.9838
63	41	416642.52	3314262.84	94	11	1075.4422	3710.0861
64	42	372817.23	2897620.32	95	12	757.25818	2634.64393
65	43	332872.40	2524803.09	96	13	544.96395	1877.38575
66	44	296736.99	2191930.69	97	14	400.26728	1332.42180
67	45	264076.15	1895193.70	98	15	292.07455	932.15452
68	46	234544.59	1631117.55	99	16	215.15707	640.07997
69	47	207864.40	1396572.96	100	17	164.95910	424.92290
70	48	183945.25	1188708.56	101	18	120.20232	259.96380
71	49	162101.37	1004963.31	102	19	80.43491	139.76148
72	50	141956.85	842861.94	103	20	45.20997	59.32657
73	51	123123.08	700905.09	104	21	14.11660	14.11660
74	52	105549.81	577782.01	Difference of Age 83 years.			
75	53	89219.577	472232.202				

Difference of Age 83 years.

COMMUTATION TABLES FOR JOINT ANNUITIES.

Difference of Age 23 years.

AGES.		D _{x,y}	N _{x,y}	AGES.		D _{x,y}	N _{x,y}
(x)	(y)			(x)	(y)		
23	0	15610971.	155137064.	77	54	63384.454	315676.651
24	1	12373028.	139526093.	78	55	52470.802	252292.197
25	2	10655666.	127153065.	79	56	43323.380	199821.395
26	3	9331169.4	116497399.5	80	57	35347.011	156498.015
27	4	8406574.9	107166230.1	81	58	28675.284	121151.004
28	5	7643104.9	98759655.2	82	59	22865.067	92475.720
29	6	7020510.3	91116550.3	83	60	18011.935	69610.653
30	7	6477479.7	84096040.0	84	61	13945.337	51598.718
31	8	5995886.4	77618560.3	85	62	10670.905	37653.381
32	9	5561932.9	71622673.9	86	63	7991.7829	26982.4761
33	10	5167554.3	66060741.0	87	64	5848.2484	18990.6932
34	11	4804386.3	60893186.7	88	65	4152.3222	13142.4448
35	12	4464794.7	56088800.4	89	66	2930.5900	8990.1226
36	13	4148021.5	51624005.7	90	67	2076.8110	6059.5326
37	14	3851870.0	47475984.2	91	68	1384.4380	3982.7216
38	15	3574535.5	43624114.2	92	69	889.5758	2598.2836
39	16	3313904.4	40049578.7	93	70	574.56662	1708.70783
40	17	3068470.8	36735674.3	94	71	380.77779	1134.14121
41	18	2837382.2	33667203.5	95	72	253.56316	753.36342
42	19	2621522.4	30829821.3	96	73	170.90029	499.80026
43	20	2420498.8	28208298.9	97	74	116.32077	328.89997
44	21	2234303.4	25787800.1	98	75	77.65474	212.57920
45	22	2062218.5	23553496.7	99	76	52.06244	134.92446
46	23	1903273.7	21491278.2	100	77	36.04751	82.86202
47	24	1756478.4	19588004.5	101	78	23.60839	46.81451
48	25	1621274.0	17831526.1	102	79	14.17743	23.20612
49	26	1497159.1	16210252.1	103	80	7.07473	9.02869
50	27	1382823.4	14713093.0	104	81	1.95396	1.95396
51	28	1277047.9	13330269.6	Difference of Age 82 years.			
52	29	1177213.3	12053221.7	82	0	60989.777	217917.173
53	30	1082947.7	10876008.4	83	1	41833.374	156927.396
54	31	994996.13	9793060.74	84	2	30809.649	115094.022
55	32	913397.57	8798064.61	85	3	22863.081	84284.373
56	33	837679.04	7884667.04	86	4	17113.371	61421.292
57	34	767456.07	7046988.00	87	5	12647.325	44307.921
58	35	701687.95	6279531.93	88	6	9185.190	31660.596
59	36	639320.28	5577843.98	89	7	6677.3706	22475.4056
60	37	579894.03	4938523.70	90	8	4898.6058	15798.0350
61	38	523010.25	4358628.77	91	9	3394.6963	10899.4292
62	39	470436.67	3835618.52	92	10	2275.9048	7504.7329
63	40	422132.32	3365181.85	93	11	1538.9579	5228.8281
64	41	378024.60	2943049.53	94	12	1070.2582	3689.8702
65	42	337726.36	2565024.93	95	13	753.47189	2619.61204
66	43	301128.05	2227298.57	96	14	542.13986	1866.14015
67	44	268042.60	1926170.52	97	15	398.05586	1324.00029
68	45	238070.06	1658127.92	98	16	290.26647	925.94443
69	46	210990.52	1420057.86	99	17	213.71376	635.67796
70	47	186468.31	1209067.34	100	18	163.81852	421.96420
71	48	164392.17	1022599.03	101	19	119.36541	258.14568
72	49	143926.24	858206.86	102	20	79.87096	138.78027
73	50	124797.64	714280.62	103	21	44.89076	58.90931
74	51	107080.23	589482.98	104	22	14.01855	14.01855
75	52	90596.75	482402.75				
76	53	76129.347	391805.998				

Difference of Age 82 years.

COMMUTATION TABLES FOR JOINT ANNUITIES.

Difference of Age 24 years.

AGES.		D_{xy}	N_{xy}	AGES.		D_{xy}	N_{xy}
(x)	(y)			(x)	(y)		
24	0	14623600.	144678255.1	78	54	53372.583	258404.055
25	1	11589868.	130054655.1	79	55	44114.032	205031.472
26	2	9978989.1	118464787.1	80	56	36031.611	160917.440
27	3	8738128.9	108485798.0	81	57	29287.302	124885.829
28	4	7869125.8	99747669.1	82	58	23432.272	95598.527
29	5	7147754.4	91878543.3	83	59	18536.026	72166.255
30	6	6558030.7	84730788.9	84	60	14428.532	53630.229
31	7	6049093.5	78172758.2	85	61	11066.938	39201.697
32	8	5598766.9	72123664.7	86	62	8302.357	28134.759
33	9	5193952.0	66524897.8	87	63	6080.8385	19832.4019
34	10	4826051.3	61330945.8	88	64	4324.3038	13751.5634
35	11	4486421.1	56504894.5	89	65	3056.1577	9427.2596
36	12	4168865.8	52018473.4	90	66	2168.9972	6371.1019
37	13	3871935.0	47849607.6	91	67	1448.7453	4202.1047
38	14	3594394.0	43977672.6	92	68	932.9096	2753.3594
39	15	3334546.8	40383278.6	93	69	604.2402	1820.4498
40	16	3089193.7	37048731.8	94	70	401.51405	1216.20960
41	17	2857137.3	33959538.1	95	71	269.41826	814.69555
42	18	2639902.5	31102400.8	96	72	183.39475	545.27729
43	19	2437589.3	28462498.3	97	73	126.17738	361.88254
44	20	2250191.4	26024909.0	98	74	85.35067	235.70516
45	21	2076642.0	23774717.6	99	75	57.56079	150.35449
46	22	1916679.3	21698075.6	100	76	40.18541	92.79370
47	23	1768937.8	19781396.3	101	77	26.44996	52.60829
48	24	1632856.5	18012458.5	102	78	15.90862	26.15833
49	25	1508190.3	16379602.0	103	79	8.02495	10.24971
50	26	1393087.8	14871411.7	104	80	2.22476	2.22476
51	27	1287045.6	13478323.9	Difference of Age 81 years.			
52	28	1187543.4	12191278.3	81	0	74636.345	275951.145
53	29	1093696.5	11003734.9	82	1	51603.450	201314.800
54	30	1005151.0	9910038.4	83	2	38461.389	149711.350
55	31	922815.75	8904887.42	84	3	28809.537	111249.961
56	32	846251.78	7982071.67	85	4	21995.579	82440.424
57	33	775248.22	7135819.89	86	5	16621.832	60444.845
58	34	708885.41	6360571.67	87	6	12422.178	43823.013
59	35	645945.98	5651686.26	88	7	9072.370	31400.835
60	36	586079.29	5005740.28	89	8	6618.6373	22328.4647
61	37	528749.87	4419660.99	90	9	4866.3782	15709.8274
62	38	475749.23	3890911.12	91	10	3377.4430	10843.4492
63	39	427206.23	3415161.89	92	11	2265.6879	7466.0062
64	40	383005.55	2987955.66	93	12	1531.5395	5200.3183
65	41	342443.60	2604950.11	94	13	1064.9069	3668.7788
66	42	305519.12	2262506.51	95	14	749.56728	2603.87191
67	43	272009.05	1956987.39	96	15	539.14461	1854.30463
68	44	241645.90	1684978.34	97	16	395.59170	1315.16002
69	45	214161.94	1443332.44	98	17	288.31931	919.56832
70	46	189272.65	1229170.50	99	18	212.23608	631.24901
71	47	166828.42	1039897.85	100	19	162.67795	419.01293
72	48	145960.19	873069.43	101	20	118.52851	256.33498
73	49	126528.97	727109.24	102	21	79.30701	137.80647
74	50	108536.60	600580.27	103	22	44.57896	58.49946
75	51	91910.36	492043.67	104	23	13.92050	13.92050
76	52	77304.461	400133.313				
77	53	64424.797	322828.852				

Difference of Age 81 years.

COMMUTATION TABLES FOR JOINT ANNUITIES.

Difference of Age 25 years.

AGES.		D _{x,y}	N _{x,y}	AGES.		D _{x,y}	N _{x,y}
(x)	(y)			(x)	(y)		
25	0	13697989.	134873306.2	79	54	44872.191	209930.187
26	1	10853866.	121175317.2	80	55	36689.188	165057.996
27	2	9344776.5	110321451.2	81	56	29854.538	128368.808
28	3	8179482.7	100976674.7	82	57	23932.388	98514.270
29	4	7359126.9	92797192.0	83	58	18995.842	74581.882
30	5	6676892.6	85438065.1	84	59	14848.358	55586.040
31	6	6124317.3	78761172.5	85	60	11450.399	40737.682
32	7	5648449.9	72636855.2	86	61	8610.4858	29287.2833
33	8	5228349.1	66988405.3	87	62	6317.1502	20676.7975
34	9	4850704.5	61760056.2	88	63	4496.2853	14359.6473
35	10	4506652.2	56909351.7	89	64	3182.7381	9863.3620
36	11	4189058.7	52402699.5	90	65	2261.9327	6680.6239
37	12	3891391.9	48213640.8	91	66	1513.0527	4418.6912
38	13	3613117.8	44322248.9	92	67	976.24339	2905.63850
39	14	3353072.1	40709131.1	93	68	633.67447	1929.39511
40	15	3108436.4	37356059.0	94	69	422.25030	1295.72064
41	16	2876433.0	34247622.6	95	70	284.09014	873.47034
42	17	2658282.7	31371189.6	96	71	194.86227	589.38020
43	18	2454679.8	28712906.9	97	72	135.40218	394.51793
44	19	2266079.5	26258227.1	98	73	92.58300	259.11575
45	20	2091408.9	23992147.6	99	74	63.26532	166.53275
46	21	1930084.9	21900738.7	100	75	44.42941	103.26743
47	22	1781397.2	19970653.8	101	76	29.48615	58.83802
48	23	1644439.0	18189256.6	102	77	17.82342	29.35187
49	24	1518964.9	16544817.6	103	78	9.00488	11.52845
50	25	1403352.2	15025852.7	104	79	2.52357	2.52357
51	26	1296599.1	13622500.5	Difference of Age 80 years.			
52	27	1196840.4	12325901.4	80	0	90079.028	345510.028
53	28	1103293.7	11129061.0	81	1	63149.811	255431.000
54	29	1015127.6	10025767.3	82	2	47443.947	192281.189
55	30	932233.92	9010639.73	83	3	35964.538	144837.242
56	31	854977.60	8078405.81	84	4	27716.406	108872.704
57	32	783182.05	7223428.21	85	5	21363.811	81156.298
58	33	716082.89	6440246.16	86	6	16325.931	59792.487
59	34	652571.68	5724163.27	87	7	12269.599	43466.556
60	35	592153.22	5071591.59	88	8	8992.5706	31196.9572
61	36	534388.79	4479438.37	89	9	6575.0936	22204.3866
62	37	480970.20	3945049.58	90	10	4841.6453	15629.2930
63	38	432030.60	3464079.38	91	11	3362.2811	10787.6477
64	39	387609.17	3032048.78	92	12	2254.7664	7425.3666
65	40	346955.73	2644439.61	93	13	1523.8818	5170.6002
66	41	309786.49	2297483.88	94	14	1059.3884	3646.7184
67	42	275975.50	1987697.39	95	15	745.42602	2587.33001
68	43	245221.73	1711721.89	96	16	535.80705	1841.90399
69	44	217378.68	1466500.16	97	17	392.93799	1306.09694
70	45	192117.63	1249121.48	98	18	286.32578	913.15895
71	46	169337.39	1057003.85	99	19	210.75839	626.83317
72	47	148123.28	887666.46	100	20	161.53737	416.07478
73	48	128317.06	739543.18	101	21	117.69161	254.53741
74	49	110042.34	611226.12	102	22	78.75618	136.84580
75	50	93160.409	501183.779	103	23	44.26717	58.08962
76	51	78425.340	408023.370	104	24	13.82245	13.82245
77	52	65419.243	329598.030				
78	53	54248.600	264178.787				

Difference of Age 80 years.

COMMUTATION TABLES FOR JOINT ANNUITIES.

Difference of Age 26 years.

AGES.		D _{x,y}	N _{x,y}	AGES.		D _{x,y}	N _{x,y}
(x)	(y)			(x)	(y)		
26	0	12828113.	125680626.7	80	54	37319.741	168946.653
27	1	10164051.	112852513.7	81	55	30399.383	131626.912
28	2	8747346.2	102688462.7	82	56	24395.911	101227.529
29	3	7649369.7	93941116.5	83	57	19401.271	76831.618
30	4	6874340.8	86291746.8	84	58	15216.695	57430.347
31	5	6235318.2	79417406.0	85	59	11783.570	42213.652
32	6	5718691.5	73182087.8	86	60	8908.8326	30430.0819
33	7	5274745.1	67463396.3	87	61	6551.6010	21521.2493
34	8	4882828.3	62188651.2	88	62	4671.0186	14969.6483
35	9	4529673.8	57305822.9	89	63	3309.3186	10298.6297
36	10	4207948.9	52776149.1	90	64	2355.6178	6989.3111
37	11	3910240.9	48568200.2	91	65	1577.8828	4633.6933
38	12	3631274.2	44657959.3	92	66	1019.5772	3055.8105
39	13	3370538.8	41026685.1	93	67	663.10874	2036.23331
40	14	3125705.5	37656146.3	94	68	442.81931	1373.12457
41	15	2894350.4	34530440.8	95	69	298.76201	930.30526
42	16	2676235.4	31636090.4	96	70	205.47400	631.54325
43	17	2471770.4	28959855.0	97	71	143.86875	426.06925
44	18	2281967.5	26488084.6	98	72	99.35170	282.20050
45	19	2106175.8	24206117.1	99	73	68.62620	182.84880
46	20	1943809.7	22099941.3	100	74	48.83257	114.22260
47	21	1793856.6	20156131.6	101	75	32.60021	65.39003
48	22	1656021.5	18362275.0	102	76	19.86938	32.78982
49	23	1529739.5	16706253.5	103	77	10.08872	12.92044
50	24	1413377.8	15176514.0	104	78	2.83172	2.83172
51	25	1306152.5	13763136.2	Difference of Age 79 years.			
52	26	1205724.2	12456983.7	79	0	108308.45	428762.81
53	27	1111931.2	11251259.5	80	1	76215.866	320454.358
54	28	1024035.4	10139328.3	81	2	58059.613	244238.492
55	29	941486.87	9115292.87	82	3	44363.964	186178.879
56	30	863703.42	8173806.00	83	4	34599.923	141814.915
57	31	791257.56	7310102.58	84	5	26920.322	107214.992
58	32	723411.21	6518845.02	85	6	20983.493	80294.670
59	33	659197.39	5795433.81	86	7	16125.403	59311.177
60	34	598227.16	5136236.42	87	8	12161.677	43185.774
61	35	539927.01	4538009.26	88	9	8933.409	31024.097
62	36	486099.57	3998082.25	89	10	6541.6764	22090.6876
63	37	436771.79	3511982.68	90	11	4819.9104	15549.0112
64	38	391986.37	3075210.89	91	12	3346.0736	10729.1008
65	39	351126.03	2683224.52	92	13	2243.4926	7383.0272
66	40	313868.32	2332098.49	93	14	1515.9848	5139.5346
67	41	279830.22	2018230.17	94	15	1053.5354	3623.5498
68	42	248797.57	1738399.95	95	16	740.81148	2570.01441
69	43	220595.41	1489602.38	96	17	532.21276	1829.20293
70	44	195003.26	1269006.97	97	18	390.22111	1296.99017
71	45	171882.72	1074003.71	98	19	284.33225	906.76906
72	46	150350.94	902120.99	99	20	209.28072	622.43681
73	47	130218.69	751770.05	100	21	160.39680	413.15609
74	48	111597.45	621551.36	101	22	116.87417	252.75929
75	49	94452.831	509953.914	102	23	78.20535	135.88512
76	50	79491.983	415501.083	103	24	43.95537	57.67977
77	51	66367.790	336009.100	104	25	13.72440	13.72440
78	52	55085.969	269641.310				
79	53	45608.688	214555.341				

Difference of Age 79 years.

COMMUTATION TABLES FOR JOINT ANNUITIES.

Difference of Age 27 years.

AGES.		D_{xy}	N_{xy}	AGES.		D_{xy}	N_{xy}
(x)	(y)			(x)	(y)		
27	0	12012825.	117063406.6	81	54	30921.838	134683.552
28	1	9514243.	105050581.6	82	55	24841.136	103761.714
29	2	8180429.8	95536338.6	83	56	19777.035	78920.578
30	3	7145463.7	87355908.8	84	57	15541.466	59143.543
31	4	6419708.2	80210445.1	85	58	12075.881	43602.077
32	5	5822340.6	73790736.9	86	59	9168.052	31526.196
33	6	5340339.4	67968396.3	87	60	6778.6092	22358.1438
34	7	4926158.2	62628056.9	88	61	4844.3759	15579.5346
35	8	4559671.6	57701898.7	89	62	3437.9243	10735.1587
36	9	4229444.6	53142227.1	90	63	2449.3028	7297.2344
37	10	3927873.7	48912782.5	91	64	1643.2359	4847.9316
38	11	3648863.2	44984908.8	92	65	1063.2633	3204.6957
39	12	3387476.2	41336045.6	93	66	692.54302	2141.43237
40	13	3141987.8	37948569.4	94	67	463.38835	1448.88935
41	14	2910430.1	34806581.6	95	68	313.31556	985.50100
42	15	2692905.8	31896151.5	96	69	216.08573	672.18544
43	16	2488463.5	29203245.7	97	70	151.70351	456.09971
44	17	2297855.6	26714782.2	98	71	105.56409	304.39620
45	18	2120942.8	24416926.6	99	72	73.64344	198.83211
46	19	1957534.4	22295983.8	100	73	52.97047	125.18867
47	20	1806612.6	20338449.4	101	74	35.83103	72.21820
48	21	1667604.0	18531836.8	102	75	21.96780	36.38717
49	22	1540514.1	16864232.8	103	76	11.24682	14.41937
50	23	1423403.5	15323718.7	104	77	3.17255	3.17255
51	24	1315483.7	13900315.2	Difference of Age 78 years.			
52	25	1214608.1	12584831.5	78	0	128825.93	527212.619
53	26	1120184.8	11370223.4	79	1	91639.78	398386.689
54	27	1032052.4	10250038.6	80	2	70072.476	306746.909
55	28	949748.42	9217986.17	81	3	54290.477	236674.433
56	29	872276.17	8268237.75	82	4	42680.646	182383.956
57	30	799333.06	7395961.58	83	5	33606.127	139703.310
58	31	730870.42	6596628.52	84	6	26441.087	106097.183
59	32	665943.57	5865758.10	85	7	20725.757	79656.096
60	33	604301.09	5199814.53	86	8	15983.566	58930.339
61	34	545465.25	4595513.44	87	9	12081.666	42946.773
62	35	491137.35	4050048.19	88	10	8888.0058	30865.1067
63	36	441429.80	3558910.84	89	11	6512.3097	21977.1009
64	37	396288.11	3117481.04	90	12	4796.6765	15464.7912
65	38	355091.24	2721192.93	91	13	3329.3432	10668.1147
66	39	317640.93	2366101.69	92	14	2231.8664	7338.7715
67	40	283517.34	2048460.76	93	15	1507.6092	5106.9051
68	41	252272.67	1764943.42	94	16	1047.0135	3599.2959
69	42	223812.14	1512670.75	95	17	735.84197	2552.28243
70	43	197888.88	1288858.61	96	18	528.53288	1816.44046
71	44	174464.42	1090969.73	97	19	387.50422	1287.90758
72	45	152610.88	916505.31	98	20	282.33873	900.40336
73	46	132177.08	763894.43	99	21	207.80304	618.06463
74	47	113251.29	631717.35	100	22	159.28275	410.26159
75	48	95787.629	518466.064	101	23	116.05674	250.97884
76	49	80594.781	422678.435	102	24	77.65451	134.92210
77	50	67270.441	342083.654	103	25	43.64357	57.26759
78	51	55884.689	274813.213	104	26	13.62402	13.62402
79	52	46312.693	218928.524				
80	53	37932.279	172615.831				

Difference of Age 78 years.

COMMUTATION TABLES FOR JOINT ANNUITIES.

Difference of Age 28 years.

AGES.		D _{x,y}	N _{x,y}	AGES.		D _{x,y}	N _{x,y}
(x)	(y)			(x)	(y)		
28	0	11244821.	108984102.	82	54	25268.065	106137.153
29	1	8897624.	97739281.	83	55	20137.966	80869.088
30	2	7641540.	88841657.	84	56	15842.473	60731.122
31	3	6672900.5	81200117.5	85	57	12333.617	44888.649
32	4	5994518.1	74527217.0	86	58	9395.4803	32555.0319
33	5	5437131.1	68532698.9	87	59	6975.8457	23159.5516
34	6	4987417.7	63095567.8	88	60	5012.2300	16183.7059
35	7	4600133.8	58108150.1	89	61	3565.5174	11171.4759
36	8	4257454.2	53508016.3	90	62	2544.4870	7605.9585
37	9	3947938.7	49250562.1	91	63	1708.5888	5061.4715
38	10	3665317.4	45302623.4	92	64	1107.3017	3352.8827
39	11	3403884.2	41637306.0	93	65	722.2166	2245.5810
40	12	3157776.6	38233421.8	94	66	483.95737	1523.36439
41	13	2925591.0	35075645.2	95	67	327.86912	1039.40702
42	14	2707866.4	32150054.2	96	68	226.61190	711.53790
43	15	2503964.2	29442187.8	97	69	159.53826	484.92600
44	16	2313374.1	26938223.6	98	70	111.31286	325.38774
45	17	2135709.7	24624849.5	99	71	78.24831	214.07488
46	18	1971259.2	22489139.8	100	72	56.84312	135.82657
47	19	1819368.7	20517880.6	101	73	38.86723	78.98345
48	20	1679462.3	18698511.9	102	74	24.14490	40.11622
49	21	1551288.7	17019049.6	103	75	12.43459	15.97132
50	22	1433429.1	15467760.9	104	76	3.53673	3.53673
51	23	1324815.0	14034331.8	Difference of Age 77 years.			
52	24	1223285.3	12709516.8	77	0	152991.68	643725.58
53	25	1128438.4	11486231.5	78	1	108999.62	490733.90
54	26	1039713.0	10357793.1	79	2	84253.143	381734.278
55	27	957183.82	9318080.11	80	3	65523.485	297481.135
56	28	879930.39	8360896.29	81	4	52230.514	231957.650
57	29	807266.88	7480965.90	82	5	41454.751	179727.136
58	30	738329.61	6673699.02	83	6	33007.872	138272.385
59	31	672810.21	5935369.41	84	7	26116.316	105264.513
60	32	610485.45	5262559.20	85	8	20543.456	79148.197
61	33	551003.48	4652073.75	86	9	15878.411	58604.741
62	34	496175.12	4101070.27	87	10	12020.262	42726.330
63	35	446004.63	3604895.15	88	11	8848.1062	30706.0681
64	36	400514.38	3158890.52	89	12	6480.9178	21857.9619
65	37	358988.09	2758376.14	90	13	4772.6930	15377.0441
66	38	321227.99	2399388.05	91	14	3312.0900	10604.3511
67	39	286925.14	2078160.06	92	15	2219.5357	7292.2611
68	40	255596.69	1791234.92	93	16	1498.2764	5072.7254
69	41	226938.26	1535638.23	94	17	1039.9899	3574.4490
70	42	200774.51	1308699.97	95	18	730.75414	2534.45909
71	43	177046.11	1107925.46	96	19	524.85301	1803.70495
72	44	154903.11	930879.35	97	20	384.78733	1278.85194
73	45	134163.85	775976.24	98	21	280.34521	894.06461
74	46	114954.51	641812.39	99	22	206.35972	613.71940
75	47	97207.176	526857.882	100	23	158.16870	407.35968
76	48	81733.740	429650.706	101	24	115.23930	249.19098
77	49	68203.690	347916.966	102	25	77.10368	133.95168
78	50	56644.761	279713.276	103	26	43.32436	56.84800
79	51	46984.205	223068.515	104	27	13.52364	13.52364
80	52	38517.792	176084.310				
81	53	31429.365	137566.518				

Difference of Age 77 years.

COMMUTATION TABLES FOR JOINT ANNUITIES.

Difference of Age 29 years.

AGES.		D _{x,y}	N _{x,y}	AGES.		D _{x,y}	N _{x,y}
(x)	(y)			(x)	(y)		
29	0	10516043.	101411092.6	83	54	20484.064	82694.576
30	1	8311488.6	90895049.6	84	55	16131.598	62210.512
31	2	7136169.0	82583561.0	85	56	12572.494	46078.914
32	3	6230941.0	75447392.0	86	57	9596.0086	33506.4197
33	4	5597917.2	69216451.0	87	58	7148.8928	23910.4111
34	5	5077812.8	63618533.8	88	59	5158.0703	16761.5183
35	6	4657339.0	58540721.0	89	60	3689.0598	11603.4480
36	7	4295234.5	53883382.0	90	61	2638.9215	7914.3882
37	8	3974084.0	49588147.5	91	62	1774.9875	5275.4667
38	9	3684041.1	45614063.5	92	63	1151.3401	3500.4792
39	10	3419233.7	41930022.4	93	64	752.12948	2349.13912
40	11	3173072.1	38510788.7	94	65	504.69362	1597.00964
41	12	2940292.5	35337716.6	95	66	342.42268	1092.31602
42	13	2721972.0	32397424.1	96	67	237.13806	749.89334
43	14	2517875.1	29675452.1	97	68	167.30983	512.75528
44	15	2327784.2	27157577.0	98	69	117.06163	345.44545
45	16	2150133.2	24829792.8	99	70	82.50952	228.38382
46	17	1984984.0	22679659.6	100	71	60.39747	145.87430
47	18	1832124.7	20694675.6	101	72	41.70880	85.47683
48	19	1691320.6	18862550.9	102	73	26.19086	43.76803
49	20	1562319.9	17171230.3	103	74	13.66692	17.57717
50	21	1443454.8	15608910.4	104	75	3.91025	3.91025
51	22	1334146.2	14165455.6	Difference of Age 76 years.			
52	23	1231962.6	12831309.4	76	0	180786.86	780915.34
53	24	1136500.0	11599346.8	77	1	129446.26	600128.48
54	25	1047373.7	10462846.8	78	2	100213.69	470682.22
55	26	964288.76	9415473.10	79	3	78783.566	370468.527
56	27	886819.20	8451184.34	80	4	63037.304	291684.961
57	28	814350.66	7564365.14	81	5	50730.324	228647.657
58	29	745657.94	6750014.48	82	6	40716.775	177917.333
59	30	679676.84	6004356.54	83	7	32602.442	137200.558
60	31	616780.26	5324679.70	84	8	25886.600	104598.116
61	32	556642.40	4707899.44	85	9	20408.301	78711.516
62	33	501212.90	4151257.04	86	10	15797.710	58303.215
63	34	450579.47	3650044.14	87	11	11966.301	42505.505
64	35	404665.18	3199464.67	88	12	8805.4547	30539.2040
65	36	362816.56	2794799.49	89	13	6448.5131	21733.7493
66	37	324753.21	2431982.93	90	14	4747.9602	15285.2362
67	38	290165.33	2107229.72	91	15	3293.7912	10537.2760
68	39	258668.89	1817064.39	92	16	2205.7957	7243.4848
69	40	229928.47	1558395.50	93	17	1488.2257	5037.6891
70	41	203578.85	1328467.03	94	18	1032.7991	3549.4634
71	42	179627.81	1124888.18	95	19	725.66631	2516.66432
72	43	157195.34	945260.37	96	20	521.17313	1790.99801
73	44	136179.00	788065.03	97	21	382.07044	1269.82488
74	45	116682.40	651886.03	98	22	278.39805	887.75444
75	46	98669.098	535203.626	99	23	204.91640	609.35639
76	47	82945.011	436534.528	100	24	157.05465	404.43999
77	48	69167.538	353589.517	101	25	114.42187	247.38534
78	49	57430.600	284421.979	102	26	76.53972	132.96347
79	50	47623.225	226991.379	103	27	43.00515	56.42375
80	51	39076.282	179368.154	104	28	13.41860	13.41860
81	52	31914.501	140291.872				
82	53	25682.795	108377.371				

Difference of Age 76 years.

COMMUTATION TABLES FOR JOINT ANNUITIES.

Difference of Age 30 years.

AGES.		D _{x,y}	N _{x,y}	AGES.		D _{x,y}	N _{x,y}
(x)	(y)			(x)	(y)		
30	0	9823293.5	94320443.6	84	54	16408.841	63596.094
31	1	7761810.7	84497150.1	85	55	12801.942	47187.253
32	2	6663526.2	76735339.4	86	56	9781.864	34385.311
33	3	5818698.2	70071813.2	87	57	7301.4719	24603.4472
34	4	5227973.2	64253115.0	88	58	5286.0245	17301.9753
35	5	4741751.6	59025141.8	89	59	3796.4001	12015.9508
36	6	4348648.1	54283390.2	90	60	2730.3581	8219.5507
37	7	4009349.7	49934742.1	91	61	1840.8633	5489.1926
38	8	3708438.7	45925392.4	92	62	1196.0831	3648.3293
39	9	3436700.4	42216953.7	93	63	782.04236	2452.24622
40	10	3187380.8	38780253.3	94	64	525.59709	1670.20386
41	11	2954534.5	35592872.5	95	65	357.09456	1144.60677
42	12	2735650.3	32638338.0	96	66	247.66421	787.51221
43	13	2530991.1	29902687.7	97	67	175.08139	539.84800
44	14	2340716.4	27371696.6	98	68	122.76403	364.76661
45	15	2163526.5	25030980.2	99	69	86.77073	242.00258
46	16	1998389.5	22867453.7	100	70	63.68658	155.23185
47	17	1844880.8	20869064.2	101	71	44.31682	91.54527
48	18	1703178.9	19024183.4	102	72	28.10566	47.22845
49	19	1573351.1	17321004.5	103	73	14.82502	19.12279
50	20	1453719.1	15747653.4	104	74	4.29777	4.29777
51	21	1343477.5	14293934.3	Difference of Age 75 years.			
52	22	1240639.8	12950456.8	75	0	211872.66	940958.52
53	23	1144561.7	11709817.0	76	1	152963.76	729085.86
54	24	1054856.2	10565255.3	77	2	119012.23	576122.10
55	25	971393.7	9510399.1	78	3	93707.982	457109.874
56	26	893401.85	8539005.40	79	4	75794.253	363401.892
57	27	820726.06	7645603.55	80	5	61226.715	287607.639
58	28	752201.09	6824877.49	81	6	49827.224	226380.924
59	29	686423.02	6072676.40	82	7	40216.659	176553.700
60	30	623075.06	5386253.38	83	8	32315.676	136337.041
61	31	562382.03	4763178.32	84	9	25716.294	104021.365
62	32	506342.27	4200796.29	85	10	20304.578	78305.071
63	33	455154.30	3694454.02	86	11	15726.792	58000.493
64	34	408815.98	3239299.72	87	12	11908.619	42273.701
65	35	366576.67	2830483.74	88	13	8761.4274	30365.0821
66	36	328216.59	2463907.07	89	14	6415.0959	21603.6547
67	37	293349.67	2135690.48	90	15	4721.7284	15188.5588
68	38	261589.99	1842340.81	91	16	3273.4010	10466.8304
69	39	232692.14	1580750.82	92	17	2190.9988	7193.4294
70	40	206261.26	1348058.68	93	18	1477.9356	5002.4306
71	41	182136.78	1141797.42	94	19	1025.6083	3524.4950
72	42	159487.57	959660.64	95	20	720.57848	2498.88673
73	43	138194.16	800173.07	96	21	517.49325	1778.30825
74	44	118434.98	661978.91	97	22	379.41674	1260.81500
75	45	100152.21	543543.93	98	23	276.45088	881.39826
76	46	84192.441	443391.725	99	24	203.47308	604.94738
77	47	70192.582	359199.284	100	25	155.94060	401.47430
78	48	58242.203	289006.702	101	26	113.58496	245.53370
79	49	48283.907	230764.499	102	27	75.97578	131.94874
80	50	39607.749	182480.592	103	28	42.67109	55.97296
81	51	32377.246	142872.843	104	29	13.30187	13.30187
82	52	26079.229	110495.597				
83	53	20820.274	84416.368				

Difference of Age 75 years.

COMMUTATION TABLES FOR JOINT ANNUITIES.

Difference of Age 31 years.

AGES.		$D_{x,y}$	$N_{x,y}$	AGES.		$D_{x,y}$	$N_{x,y}$
(x)	(y)			(x)	(y)		
31	0	9173632.8	87692033.2	85	54	13021.961	48225.128
32	1	7247730.5	78518400.4	86	55	9960.383	35203.167
33	2	6222663.3	71270669.9	87	56	7442.8868	25242.7838
34	3	5434163.6	65048006.6	88	57	5398.8444	17799.8970
35	4	4881974.0	59613843.0	89	58	3890.5759	12401.0526
36	5	4427465.8	54731869.0	90	59	2809.8031	8510.4767
37	6	4059208.2	50304403.2	91	60	1904.6479	5700.6736
38	7	3741347.2	46245195.0	92	61	1240.4738	3796.0257
39	8	3459460.0	42503847.8	93	62	812.43385	2555.55191
40	9	3203663.1	39044387.8	94	63	546.50058	1743.11806
41	10	2967857.7	35840724.7	95	64	371.88475	1196.61748
42	11	2748901.1	32872867.0	96	65	258.27595	824.73273
43	12	2543709.7	30123965.9	97	66	182.85296	566.45678
44	13	2352909.5	27580256.2	98	67	128.46644	383.60382
45	14	2175546.1	25227346.7	99	68	90.99760	255.13738
46	15	2010837.6	23051800.6	100	69	66.97568	164.13978
47	16	1857340.2	21040963.0	101	70	46.73020	97.16410
48	17	1715037.1	19183622.8	102	71	29.86309	50.43390
49	18	1584382.2	17468585.7	103	72	15.90886	20.57081
50	19	1463983.5	15884203.5	104	73	4.66195	4.66195
51	20	1353030.9	14420220.0	Difference of Age 74 years.			
52	21	1249317.1	13067189.1	74	0	246842.40	1126597.41
53	22	1152623.3	11817872.0	75	1	179265.46	879755.01
54	23	1062338.7	10665248.7	76	2	140634.10	700489.55
55	24	978333.4	9602910.0	77	3	111286.15	559855.45
56	25	899984.48	8624576.57	78	4	90152.386	448569.296
57	26	826818.09	7724592.09	79	5	73617.253	358416.910
58	27	758089.94	6897774.00	80	6	60136.759	284799.657
59	28	692446.38	6139684.06	81	7	49215.206	224662.898
60	29	629259.42	5447237.68	82	8	39862.918	175447.692
61	30	568121.64	4817978.26	83	9	32103.072	135584.774
62	31	511563.24	4249856.62	84	10	25585.594	103481.702
63	32	459812.31	3738293.38	85	11	20213.428	77896.108
64	33	412966.78	3278481.07	86	12	15650.982	57682.680
65	34	370336.79	2865514.29	87	13	11849.076	42031.698
66	35	331618.12	2495177.50	88	14	8716.0244	30182.6223
67	36	296478.13	2163559.38	89	15	6379.6534	21466.5979
68	37	264460.73	1867081.25	90	16	4692.4986	15086.9445
69	38	235319.89	1602620.52	91	17	3251.4424	10394.4459
70	39	208740.46	1367300.63	92	18	2175.8496	7143.0035
71	40	184536.67	1158560.17	93	19	1467.6456	4967.1539
72	41	161715.23	974023.50	94	20	1018.4175	3499.5083
73	42	140209.31	812308.27	95	21	715.49065	2481.09084
74	43	120187.56	672098.96	96	22	513.89895	1765.60019
75	44	101656.50	551911.40	97	23	376.76303	1251.70124
76	45	85457.949	450254.899	98	24	274.50372	874.93821
77	46	71248.225	364796.950	99	25	202.02978	600.43449
78	47	59105.336	293548.725	100	26	154.80002	398.40471
79	48	48966.250	234443.389	101	27	112.74806	243.60469
80	49	40157.231	185477.139	102	28	75.38559	130.85663
81	50	32817.601	145319.908	103	29	42.29990	55.47104
82	51	26457.365	112502.307	104	30	13.17114	13.17114
83	52	21141.651	86044.942				
84	53	16678.163	64903.291				

Difference of Age 74 years.

COMMUTATION TABLES FOR JOINT ANNUITIES.

Difference of Age 32 years.

AGES.		D _{x,y}	N _{x,y}	AGES.		D _{x,y}	N _{x,y}
(x)	(y)			(x)	(y)		
32	0	8566044.8	81497968.6	86	54	10131.566	35969.166
33	1	6768216.3	72931923.8	87	55	7578.7195	25837.6003
34	2	5811432.3	66163707.5	88	56	5503.4092	18258.8808
35	3	5074518.3	60352275.2	89	57	3973.6128	12755.4716
36	4	4558394.2	55277756.9	90	58	2879.5049	8781.8588
37	5	4132779.8	50719362.7	91	59	1960.0672	5902.3539
38	6	3787872.9	46586582.9	92	60	1283.4553	3942.2867
39	7	3490159.0	42798710.0	93	61	842.58603	2658.83138
40	8	3224879.4	39308551.0	94	62	567.73852	1816.24535
41	9	2983018.6	36083671.6	95	63	386.67496	1248.50683
42	10	2761297.0	33100653.0	96	64	268.97326	861.83187
43	11	2556030.8	30339356.0	97	65	190.68771	592.85861
44	12	2364733.2	27783325.2	98	66	134.16884	402.17090
45	13	2186878.8	25418592.0	99	67	95.22444	268.00206
46	14	2022008.9	23231713.2	100	68	70.23825	172.77762
47	15	1868909.6	21209704.3	101	69	49.14359	102.53937
48	16	1726619.6	19340794.7	102	70	31.48936	53.39578
49	17	1595413.4	17614175.1	103	71	16.90363	21.90642
50	18	1474247.8	16018761.7	104	72	5.00279	5.00279
51	19	1362584.3	14544513.9	Difference of Age 73 years.			
52	20	1258200.9	13181929.6	73	0	283824.52	1338589.90
53	21	1160684.9	11923728.7	74	1	208853.35	1054765.38
54	22	1069821.3	10763043.8	75	2	164815.74	845912.03
55	23	985273.11	9693222.49	76	3	131504.36	681096.29
56	24	906414.03	8707949.38	77	4	107063.58	549591.93
57	25	832910.14	7801535.35	78	5	87562.984	442528.352
58	26	763717.05	6968625.21	79	6	72306.721	354965.368
59	27	697867.41	6204908.16	80	7	59398.111	282658.647
60	28	634781.19	5507040.75	81	8	48782.315	223260.536
61	29	573760.57	4872259.56	82	9	39600.662	174478.221
62	30	516784.21	4298498.99	83	10	31939.912	134877.559
63	31	464553.50	3781714.78	84	11	25470.736	102937.647
64	32	417193.05	3317161.28	85	12	20115.991	77466.911
65	33	374096.90	2899968.23	86	13	15572.727	57350.920
66	34	335019.65	2525871.33	87	14	11787.672	41778.193
67	35	299550.74	2190851.68	88	15	8667.8695	29990.5214
68	36	267281.11	1891300.94	89	16	6340.1603	21322.6519
69	37	237902.34	1624019.83	90	17	4661.0204	14982.4916
70	38	211097.73	1386117.49	91	18	3228.9610	10321.4712
71	39	186754.74	1175019.76	92	19	2160.7004	7092.5102
72	40	163846.04	988265.02	93	20	1457.3556	4931.8098
73	41	142167.70	824418.98	94	21	1011.2267	3474.4542
74	42	121940.15	682251.28	95	22	710.52115	2463.22754
75	43	103160.80	560311.13	96	23	510.30466	1752.70639
76	44	86741.535	457150.329	97	24	374.10932	1242.40173
77	45	72319.167	370408.794	98	25	272.55655	868.29241
78	46	59994.236	298089.627	99	26	200.55210	595.73586
79	47	49691.917	238095.391	100	27	153.65944	395.18376
80	48	40724.729	188403.474	101	28	111.87223	241.52432
81	49	33272.883	147678.745	102	29	74.72984	129.65209
82	50	26817.205	114405.862	103	30	41.88418	54.92225
83	51	21448.195	87588.657	104	31	13.03807	13.03807
84	52	16935.603	66140.462				
85	53	13235.693	49204.859				

Difference of Age 73 years.

COMMUTATION TABLES FOR JOINT ANNUITIES.

Difference of Age 33 years.

AGES.		$D_{x,y}$	$N_{x,y}$	AGES.		$D_{x,y}$	$N_{x,y}$
(x)	(y)			(x)	(y)		
33	0	7999310.1	75710519.9	87	54	7708.9701	26395.0530
34	1	6320931.9	67711209.8	88	55	5603.8465	18686.0829
35	2	5426818.5	61390277.9	89	56	4050.5736	13082.2364
36	3	4738176.5	55963459.4	90	57	2940.9622	9031.6628
37	4	4254993.9	51225282.9	91	58	2008.6898	6090.7006
38	5	3856526.6	46970289.0	92	59	1320.7999	4082.0108
39	6	3533561.1	43113762.4	93	60	871.78101	2761.21093
40	7	3253496.7	39580201.3	94	61	588.80923	1889.42992
41	8	3002773.7	36326704.6	95	62	401.70180	1300.62069
42	9	2775402.7	33323930.9	96	63	279.67057	898.91889
43	10	2567557.0	30548528.2	97	64	198.58565	619.24832
44	11	2376187.4	27980971.2	98	65	139.91762	420.66267
45	12	2197868.2	25604783.8	99	66	99.45130	280.74505
46	13	2032541.9	23406915.6	100	67	73.50083	181.29375
47	14	1879292.4	21374373.7	101	68	51.53752	107.79292
48	15	1737374.8	19495081.3	102	69	33.11563	56.25540
49	16	1606188.0	17757706.5	103	70	17.82416	23.13977
50	17	1484512.2	16151518.5	104	71	5.31561	5.31561
51	18	1372137.7	14667006.3	Difference of Age 72 years.			
52	19	1267084.8	13294868.6				
53	20	1168938.5	12027783.8	72	0	322849.34	1577953.91
54	21	1077303.8	10858845.3	73	1	240143.93	1255104.57
55	22	992212.82	9781541.49	74	2	192018.70	1014960.64
56	23	912843.59	8789328.67	75	3	154116.17	822941.94
57	24	838860.52	7876485.08	76	4	126514.64	668825.77
58	25	769344.17	7037624.56	77	5	103988.44	542311.13
59	26	703047.51	6268280.39	78	6	86004.192	438322.694
60	27	639750.77	5565232.88	79	7	71418.591	352318.502
61	28	578795.32	4925482.11	80	8	58875.653	280899.911
62	29	521913.58	4346686.79	81	9	48461.379	222024.258
63	30	469294.69	3824773.21	82	10	39399.396	173562.879
64	31	421494.78	3355478.52	83	11	31796.528	134163.483
65	32	377925.37	2933983.74	84	12	25347.956	102366.955
66	33	338421.17	2556058.37	85	13	20015.411	77018.999
67	34	302623.34	2217637.20	86	14	15492.027	57003.588
68	35	270051.12	1915013.86	87	15	11722.547	41511.561
69	36	240439.48	1644962.74	88	16	8614.2113	29789.0142
70	37	213414.36	1404523.26	89	17	6297.6293	21174.8029
71	38	188863.73	1191108.90	90	18	4628.7928	14877.1736
72	39	165815.42	1002245.17	91	19	3206.4796	10248.3808
73	40	144040.94	836429.75	92	20	2145.5511	7041.9012
74	41	123643.36	692388.81	93	21	1447.0655	4896.3501
75	42	104665.09	568745.45	94	22	1004.2032	3449.2846
76	43	88025.122	464080.358	95	23	705.55164	2445.08139
77	44	73405.408	376055.236	96	24	506.71036	1739.52975
78	45	60896.017	302649.828	97	25	371.45562	1232.81939
79	46	50439.245	241753.811	98	26	270.56303	861.36377
80	47	41328.258	191314.566	99	27	199.07441	590.80074
81	48	33743.091	149986.308	100	28	152.46581	391.72633
82	49	27189.243	116243.217	101	29	110.89909	239.26052
83	50	21739.906	89053.974	102	30	73.99539	128.36143
84	51	17181.162	67314.068	103	31	41.46103	54.36604
85	52	13439.996	50132.906	104	32	12.90501	12.90501
86	53	10297.857	36692.910				

Difference of Age 72 years.

COMMUTATION TABLES FOR JOINT ANNUITIES.

Difference of Age 34 years.

AGES.		D _{x,y}	N _{x,y}	AGES.		D _{x,y}	N _{x,y}
(x)	(y)			(x)	(y)		
34	0	7470667.6	70302098.9	88	54	5700.1561	19086.8909
35	1	5902598.2	62831431.3	89	55	4124.4965	13386.7348
36	2	5067126.1	56928833.1	90	56	2997.9228	9262.2383
37	3	4422810.1	51861707.0	91	57	2051.5614	6264.3155
38	4	3970571.3	47438896.9	92	58	1353.5644	4212.7541
39	5	3597605.5	43468325.6	93	59	897.14713	2859.18974
40	6	3293955.8	39870720.1	94	60	609.21101	1962.04261
41	7	3029420.1	36576764.3	95	61	416.61031	1352.83160
42	8	2793782.9	33547344.2	96	62	290.53904	936.22129
43	9	2580673.0	30753561.3	97	63	206.48358	645.68225
44	10	2386902.5	28172888.3	98	64	145.71274	439.19867
45	11	2208514.1	25785985.8	99	65	103.71252	293.48593
46	12	2042755.6	23577471.7	100	66	76.76341	189.77341
47	13	1889082.0	21534716.1	101	67	53.93145	113.01000
48	14	1747026.9	19645634.1	102	68	34.72878	59.07855
49	15	1616193.0	17898607.2	103	69	18.74469	24.34977
50	16	1494537.8	16282414.2	104	70	5.60508	5.60508
51	17	1381691.1	14787876.4	Difference of Age 71 years.			
52	18	1275968.6	13406185.3	71	0	363619.05	1845487.63
53	19	1177192.1	12130216.7	72	1	273162.83	1481868.58
54	20	1084964.4	10953024.6	73	2	220787.09	1208705.75
55	21	999152.52	9868060.18	74	3	179553.16	987918.66
56	22	919273.14	8868907.66	75	4	148268.49	808365.50
57	23	844810.89	7949634.52	76	5	122880.83	660097.01
58	24	774840.41	7104823.63	77	6	102137.25	537216.18
59	25	708227.62	6329983.22	78	7	84947.817	435078.926
60	26	644499.47	5621755.60	79	8	70790.402	350131.109
61	27	583326.61	4977256.13	80	9	58488.313	279340.707
62	28	526493.38	4393929.52	81	10	48215.079	220852.394
63	29	473952.70	3867436.14	82	11	39222.526	172637.315
64	30	425796.52	3393483.44	83	12	31643.256	133414.789
65	31	381822.22	2967686.92	84	13	25221.217	101771.533
66	32	341884.55	2585864.70	85	14	19911.688	76550.316
67	33	305695.94	2243980.15	86	15	15406.436	56638.628
68	34	272821.14	1938284.21	87	16	11649.978	41232.192
69	35	242931.32	1665463.07	88	17	8556.4255	29582.2139
70	36	215690.35	1422531.75	89	18	6254.0856	21025.7884
71	37	190936.36	1206841.40	90	19	4596.5651	14771.7028
72	38	167687.95	1015905.04	91	20	3183.9982	10175.1377
73	39	145772.27	848217.09	92	21	2130.4019	6991.1395
74	40	125272.52	702444.82	93	22	1437.0148	4860.7376
75	41	106127.01	577172.30	94	23	997.17961	3423.72278
76	42	89308.708	471045.295	95	24	700.58213	2426.54317
77	43	74491.649	381736.587	96	25	503.11607	1725.96104
78	44	61810.681	307244.938	97	26	368.73873	1222.84497
79	45	51197.404	245434.257	98	27	268.56950	854.10624
80	46	41949.803	194236.853	99	28	197.52801	585.53674
81	47	34243.155	152287.050	100	29	151.13956	388.00873
82	48	27573.478	118043.895	101	30	109.80918	236.86917
83	49	22041.506	90470.417	102	31	73.24784	127.05999
84	50	17414.838	68428.911	103	32	41.03788	53.81215
85	51	13634.870	51014.073	104	33	12.77427	12.77427
86	52	10456.613	37379.203				
87	53	7835.499	26922.390				

Difference of Age 71 years.

COMMUTATION TABLES FOR JOINT ANNUITIES.

Difference of Age 35 years.

AGES.		D _{x,y}	N _{x,y}	AGES.		D _{x,y}	N _{x,y}
(x)	(y)			(x)	(y)		
35	0	6976241.8	65246739.4	89	54	4195.3815	13672.7689
36	1	5511370.9	58270497.6	90	55	3052.6348	9477.3874
37	2	4729865.3	52759126.7	91	56	2091.2960	6424.7526
38	3	4127170.1	48029261.4	92	57	1382.4536	4333.4566
39	4	3703993.5	43902091.3	93	58	919.40232	2951.00300
40	5	3353657.5	40198097.8	94	59	626.93717	2031.60068
41	6	3067092.6	36844440.3	95	60	431.04554	1404.66351
42	7	2818574.7	33777347.7	96	61	301.32193	973.61797
43	8	2597763.5	30958773.0	97	62	214.50788	672.29604
44	9	2399095.7	28361009.5	98	63	151.50788	457.78816
45	10	2218473.2	25961913.8	99	64	108.00809	306.28028
46	11	2052650.2	23743440.6	100	65	80.05251	198.27219
47	12	1898574.8	21690790.4	101	66	56.32537	118.21968
48	13	1756127.4	19792215.6	102	67	36.34195	61.89431
49	14	1625171.8	18036088.2	103	68	19.65780	25.55236
50	15	1503847.4	16410916.4	104	69	5.89456	5.89456
51	16	1391022.4	14907069.0	Difference of Age 70 years.			
52	17	1284852.5	13516046.6	70	0	406426.13	2142391.29
53	18	1185445.7	12231194.1	71	1	307658.08	1735965.16
54	19	1092625.1	11045748.4	72	2	251144.50	1428307.08
55	20	1006257.5	9953123.3	73	3	206453.96	1177162.58
56	21	925702.69	8946865.77	74	4	172740.31	970708.62
57	22	850761.26	8021163.08	75	5	144009.85	797968.31
58	23	780336.67	7170401.82	76	6	120693.31	653958.46
59	24	713287.24	6390065.15	77	7	100882.71	533265.15
60	25	649248.19	5676777.91	78	8	84200.628	432382.444
61	26	587656.48	5027529.72	79	9	70324.677	348181.816
62	27	530615.19	4439873.24	80	10	58191.052	277857.139
63	28	478111.64	3909258.05	81	11	47998.633	219666.087
64	29	430022.79	3431146.41	82	12	39033.457	171667.454
65	30	385719.06	3001123.62	83	13	31485.040	132633.997
66	31	345409.77	2615404.56	84	14	25090.516	101148.957
67	32	308824.41	2269994.79	85	15	19801.679	76058.441
68	33	275591.15	1961170.38	86	16	15311.063	56256.762
69	34	245423.15	1685579.23	87	17	11571.828	40945.699
70	35	217925.69	1440156.08	88	18	8497.2638	29373.8711
71	36	192972.63	1222230.39	89	19	6210.5419	20876.6073
72	37	169528.19	1029257.76	90	20	4564.3375	14666.0654
73	38	147418.46	859729.57	91	21	3161.5168	10101.7279
74	39	126778.26	712311.11	92	22	2115.6050	6940.2111
75	40	107525.37	585532.85	93	23	1426.9641	4824.6061
76	41	90556.138	478007.484	94	24	990.15605	3397.64198
77	42	75577.890	387451.346	95	25	695.61262	2407.48593
78	43	62725.345	311873.456	96	26	499.43619	1711.87331
79	44	51966.394	249148.111	97	27	366.02184	1212.43712
80	45	42580.357	197181.717	98	28	266.48326	846.41528
81	46	34758.146	154601.360	99	29	195.80978	579.93202
82	47	27982.110	119843.214	100	30	149.65416	384.12224
83	48	22352.994	91861.104	101	31	108.69978	234.46808
84	49	17656.436	69508.110	102	32	72.50027	125.76830
85	50	13820.314	51851.674	103	33	40.62216	53.26803
86	51	10608.431	38031.360	104	34	12.64587	12.64587
87	52	7956.4459	27422.9289				
88	53	5793.7141	19466.4830				

Difference of Age 70 years.

COMMUTATION TABLES FOR JOINT ANNUITIES.

Difference of Age 36 years.

AGES.		D _{xy}	N _{xy}	AGES.		D _{xy}	N _{xy}
(x)	(y)			(x)	(y)		
36	0	6513852.8	60521473.0	90	54	3105.0985	9679.6374
37	1	5144541.7	54007620.2	91	55	2129.4622	6574.5389
38	2	4413700.3	48863078.5	92	56	1409.2290	4445.0767
39	3	3850078.4	44449378.2	93	57	939.02516	3035.84768
40	4	3452831.4	40599299.8	94	58	642.48936	2096.82252
41	5	3122682.5	37146468.4	95	59	443.58763	1454.33316
42	6	2853625.2	34023785.9	96	60	311.76252	1010.74553
43	7	2620815.9	31170160.7	97	61	222.46899	698.98301
44	8	2414983.8	28549344.8	98	62	157.39573	476.51402
45	9	2229805.9	26134361.0	99	63	112.30368	319.11829
46	10	2061906.5	23904555.1	100	64	83.36814	206.81461
47	11	1907771.1	21842648.6	101	65	58.73876	123.44647
48	12	1764952.2	19934877.5	102	66	37.95510	64.70771
49	13	1633637.6	18169925.3	103	67	20.57090	26.75261
50	14	1512202.1	16536287.7	104	68	6.18171	6.18171
51	15	1399687.1	15024085.6	Difference of Age 69 years.			
52	16	1293529.7	13624398.5	69	0	453061.02	2471657.34
53	17	1193699.3	12330868.8	70	1	343877.15	2018596.32
54	18	1100285.8	11137169.5	71	2	282859.26	1674719.17
55	19	1013362.4	10036883.7	72	3	234840.61	1391859.91
56	20	932285.34	9023521.35	73	4	198620.40	1157019.30
57	21	856711.63	8091236.01	74	5	167778.78	958398.90
58	22	785832.92	7234524.38	75	6	141446.19	790620.12
59	23	718346.86	6448691.46	76	7	119210.86	649173.93
60	24	653886.47	5730344.60	77	8	99995.362	529963.074
61	25	591986.38	5076458.13	78	9	83646.676	429967.712
62	26	534553.82	4484471.75	79	10	69967.259	346321.036
63	27	481854.69	3949917.93	80	11	57929.823	276353.777
64	28	433796.24	3468063.24	81	12	47767.261	218423.954
65	29	389547.54	3034267.00	82	13	38838.290	170656.693
66	30	348934.99	2644719.46	83	14	31321.879	131818.403
67	31	312008.74	2295784.47	84	15	24951.895	100496.524
68	32	278411.53	1983775.73	85	16	19679.097	75544.629
69	33	247914.99	1705364.20	86	17	15208.353	55865.532
70	34	220161.03	1457449.21	87	18	11491.817	40657.179
71	35	194972.53	1237288.18	88	19	8438.1022	29165.3624
72	36	171336.14	1042315.65	89	20	6166.9983	20727.2602
73	37	149036.25	870979.51	90	21	4532.1098	14560.2619
74	38	128209.94	721943.26	91	22	3139.5581	10028.1521
75	39	108817.80	593733.32	92	23	2100.8081	6888.5940
76	40	91749.331	484915.523	93	24	1416.9133	4787.7859
77	41	76633.533	393166.192	94	25	983.13247	3370.87257
78	42	63640.010	316532.659	95	26	690.52480	2387.74010
79	43	52735.385	252892.649	96	27	495.75632	1697.21530
80	44	43219.918	200157.264	97	28	363.17859	1201.45898
81	45	35280.600	156937.346	98	29	264.16520	838.28039
82	46	28402.930	121656.746	99	30	193.88536	574.11519
83	47	22684.259	93253.807	100	31	148.14224	380.22983
84	48	17905.955	70569.548	101	32	107.59041	232.08759
85	49	14012.045	52663.593	102	33	71.76583	124.49718
86	50	10752.714	38651.548	103	34	40.21387	52.73135
87	51	8071.8108	27898.8340	104	35	12.51748	12.51748
88	52	5883.1445	19827.0232				
89	53	4264.2413	13943.8787				

Difference of Age 69 years.

COMMUTATION TABLES FOR JOINT ANNUITIES.

Difference of Age 37 years.

AGES.		$D_{x,y}$	$N_{x,y}$	AGES.		$D_{x,y}$	$N_{x,y}$
(x)	(y)			(x)	(y)		
37	0	6080299.9	56104586.1	91	54	2166.0599	6715.3191
38	1	4800657.9	50024286.2	92	55	1434.9474	4549.2592
39	2	4117371.4	45223628.3	93	56	957.2122	3114.3118
40	3	3589010.5	41106256.9	94	57	656.20205	2157.09960
41	4	3215026.1	37517246.4	95	58	454.59154	1500.89755
42	5	2905346.1	34302220.3	96	59	320.83384	1046.30601
43	6	2653407.2	31396874.2	97	60	230.17738	725.47217
44	7	2436414.2	28743467.0	98	61	163.23722	495.29479
45	8	2244572.9	26307052.8	99	62	116.66798	332.05757
46	9	2072439.4	24062479.9	100	63	86.68376	215.38959
47	10	1916374.0	21990040.5	101	64	61.17161	128.70583
48	11	1773501.2	20073666.5	102	65	39.58137	67.53422
49	12	1641846.8	18300165.3	103	66	21.48401	27.95285
50	13	1520079.4	16658318.5	104	67	6.46884	6.46884
51	14	1407463.2	15138239.1	Difference of Age 68 years.			
52	15	1301587.2	13730775.9	68	0	503638.80	2836130.99
53	16	1201760.9	12429188.7	69	1	383334.93	2332492.19
54	17	1107946.4	11227427.8	70	2	316158.89	1949157.26
55	18	1020467.3	10119481.4	71	3	264496.50	1632998.37
56	19	938867.97	9099014.08	72	4	225929.97	1368501.87
57	20	862803.67	8160146.11	73	5	192915.53	1142571.90
58	21	791329.16	7297342.44	74	6	164791.99	949656.37
59	22	723406.50	6506013.28	75	7	139708.83	784864.38
60	23	658524.75	5782606.78	76	8	118162.29	645155.55
61	24	596215.57	5124082.03	77	9	99337.498	526993.258
62	25	538492.44	4527866.46	78	10	83221.551	427655.760
63	26	485431.38	3989374.02	79	11	69653.164	344434.209
64	27	437192.35	3503942.64	80	12	57650.578	274781.045
65	28	392965.82	3066750.29	81	13	47528.424	217130.467
66	29	352398.37	2673784.47	82	14	38637.024	169602.043
67	30	315193.07	2321386.10	83	15	31148.830	130965.019
68	31	281282.27	2006193.03	84	16	24797.430	99816.189
69	32	250452.13	1724910.76	85	17	19547.086	75018.759
70	33	222396.38	1474458.63	86	18	15103.198	55471.673
71	34	196972.44	1252062.25	87	19	11411.806	40368.475
72	35	173111.82	1055089.81	88	20	8378.9405	28956.6688
73	36	150625.67	881977.99	89	21	6123.4546	20577.7283
74	37	129616.94	731352.32	90	22	4500.6316	14454.2737
75	38	110046.66	601735.38	91	23	3117.5995	9953.6421
76	39	92852.132	491688.721	92	24	2086.0112	6836.0426
77	40	77643.278	398836.589	93	25	1406.8626	4750.0314
78	41	64528.908	321193.311	94	26	975.94168	3343.16882
79	42	53504.374	256664.403	95	27	685.43696	2367.22714
80	43	43859.479	203160.029	96	28	491.90528	1681.79018
81	44	35810.518	159300.550	97	29	360.01941	1189.88490
82	45	28829.868	123490.032	98	30	261.56898	829.86549
83	46	23025.413	94660.164	99	31	191.92656	568.29651
84	47	18171.316	71634.751	100	32	146.63031	376.36995
85	48	14210.062	53463.435	101	33	106.50050	229.73964
86	49	10901.887	39253.373	102	34	71.04450	123.23914
87	50	8181.5934	28351.4862	103	35	39.80556	52.19464
88	51	5968.4473	20169.8928	104	36	12.38908	12.38908
89	52	4330.0632	14201.4455				
90	53	3156.0632	9871.3823				

Difference of Age 68 years.

COMMUTATION TABLES FOR JOINT ANNUITIES.

Difference of Age 38 years.

AGES.		D _{x,y}	N _{x,y}	AGES.		D _{x,y}	N _{x,y}
(x)	(y)			(x)	(y)		
38	0	5673865.9	51976860.5	92	54	1459.6089	4647.0923
39	1	4478349.3	46302994.6	93	55	974.68132	3187.48345
40	2	3838178.8	41824645.3	94	56	668.91136	2212.80213
41	3	3341826.2	37986466.5	95	57	464.29392	1543.89077
42	4	2991262.6	34644640.3	96	58	328.79264	1079.59685
43	5	2701499.2	31653377.7	97	59	236.87483	750.80421
44	6	2466712.3	28951878.5	98	60	168.89326	513.92938
45	7	2264491.0	26485166.2	99	61	120.99792	345.03612
46	8	2086164.2	24220675.2	100	62	90.05245	224.03820
47	9	1926163.5	22134511.0	101	63	63.60446	133.98575
48	10	1781498.6	20208347.5	102	64	41.22076	70.38129
49	11	1649799.5	18426848.9	103	65	22.40455	29.16053
50	12	1527717.9	16777049.4	104	66	6.75598	6.75598
51	13	1414794.9	15249331.5	Difference of Age 67 years.			
52	14	1308818.2	13834536.6	67	0	558654.86	3239012.07
53	15	1209246.8	12525718.4	68	1	426128.79	2680357.21
54	16	1115429.0	11316471.6	69	2	352436.17	2254228.42
55	17	1027572.3	10201042.6	70	3	295634.37	1901792.25
56	18	945450.61	9173470.33	71	4	254460.61	1606157.88
57	19	868895.72	8228019.72	72	5	219440.70	1351697.27
58	20	796956.28	7359124.00	73	6	189481.25	1132256.57
59	21	728466.12	6562167.72	74	7	162767.88	942775.32
60	22	663163.02	5833701.60	75	8	138479.97	780007.44
61	23	600444.76	5170538.58	76	9	117384.91	641527.47
62	24	542339.47	4570093.82	77	10	98832.625	524142.557
63	25	489008.06	4027754.35	78	11	82847.956	425309.932
64	26	440437.52	3538746.29	79	12	69317.408	342461.976
65	27	396042.27	3098308.77	80	13	57362.325	273144.568
66	28	355490.66	2702266.50	81	14	47282.124	215782.243
67	29	318321.54	2346775.84	82	15	38423.559	168500.119
68	30	284153.01	2028454.30	83	16	30956.004	130076.560
69	31	253034.58	1744301.29	84	17	24631.085	99120.556
70	32	224672.36	1491266.71	85	18	19411.931	74489.471
71	33	198972.34	1266594.35	86	19	14998.043	55077.540
72	34	174887.49	1067622.01	87	20	11331.795	40079.497
73	35	152186.71	892734.52	88	21	8319.7789	28747.7024
74	36	130999.26	740547.81	89	22	6080.9236	20427.9235
75	37	111254.33	609548.55	90	23	4469.1533	14346.9999
76	38	93900.696	498294.220	91	24	3095.6409	9877.8466
77	39	78576.527	404393.524	92	25	2071.2143	6782.2057
78	40	65379.160	325816.997	93	26	1396.5726	4710.9914
79	41	54251.703	260437.837	94	27	968.75088	3314.41879
80	42	44499.040	206186.134	95	28	680.11249	2345.66791
81	43	36340.436	161687.094	96	29	487.62636	1665.55542
82	44	29262.895	125346.658	97	30	356.48114	1177.92906
83	45	23371.511	96083.763	98	31	258.92641	821.44792
84	46	18444.599	72712.252	99	32	189.96778	562.52151
85	47	14420.651	54267.653	100	33	145.14491	372.55373
86	48	11055.952	39847.002	101	34	105.43004	227.40882
87	49	8295.0974	28791.0505	102	35	70.32317	121.97878
88	50	6049.6226	20495.9531	103	36	39.39726	51.65561
89	51	4392.8470	14446.3305	104	37	12.25835	12.25835
90	52	3204.7794	10053.4835				
91	53	2201.6118	6848.7041				

Difference of Age 67 years.

COMMUTATION TABLES FOR JOINT ANNUITIES.

Difference of Age 39 years.

AGES.		D _{x,y}	N _{x,y}	AGES.		D _{x,y}	N _{x,y}
(x)	(y)			(x)	(y)		
39	0	5292931.5	48120092.0	93	54	991.43253	3256.10575
40	1	4174679.4	42827160.5	94	55	681.11899	2264.67322
41	2	3573833.6	38652481.1	95	56	473.28636	1583.55423
42	3	3109237.5	35078647.5	96	57	335.81007	1110.26787
43	4	2781387.6	31969410.0	97	58	242.75090	774.45780
44	5	2511420.5	29188022.4	98	59	173.80754	531.70690
45	6	2292651.2	26676601.9	99	60	125.19042	357.89936
46	7	2104676.7	24383050.7	100	61	93.39460	232.70894
47	8	1938919.6	22279274.0	101	62	66.07623	139.31434
48	9	1790599.1	20340354.4	102	63	42.86015	73.23811
49	10	1657239.2	18549755.3	103	64	23.33250	30.37796
50	11	1535117.8	16892516.1	104	65	7.04546	7.04546
51	12	1421904.4	15357398.3	Difference of Age 66 years.			
52	13	1315636.1	13935493.9	66	0	618459.75	3683674.14
53	14	1215964.8	12619857.8	67	1	472677.88	3065214.39
54	15	1122377.0	11403893.0	68	2	391780.62	2592536.51
55	16	1034512.0	10281516.0	69	3	329556.58	2200755.89
56	17	952033.25	9247003.97	70	4	284417.01	1871199.31
57	18	874987.76	8294970.72	71	5	247151.87	1586782.30
58	19	802583.39	7419982.96	72	6	215534.22	1339630.43
59	20	733646.22	6617399.57	73	7	187153.89	1124096.21
60	21	667801.30	5883753.35	74	8	161336.19	936942.32
61	22	604673.96	5215952.05	75	9	137568.92	775606.13
62	23	546186.50	4611278.09	76	10	116788.31	638037.21
63	24	492501.57	4065091.59	77	11	98388.949	521248.905
64	25	443682.69	3572590.02	78	12	82448.595	422859.956
65	26	398982.00	3128907.33	79	13	68970.821	340411.361
66	27	358273.73	2729925.33	80	14	57065.064	271440.540
67	28	321114.81	2371651.60	81	15	47020.897	214375.476
68	29	286973.39	2050536.79	82	16	38185.699	167354.579
69	30	255617.03	1763563.40	83	17	30748.345	129168.880
70	31	226988.99	1507946.37	84	18	24460.778	98420.535
71	32	201008.61	1280957.38	85	19	19276.777	73959.757
72	33	176663.16	1079948.77	86	20	14892.888	54682.980
73	34	153747.74	903285.61	87	21	11251.784	39790.092
74	35	132356.89	749537.87	88	22	8261.9931	28538.3081
75	36	112440.82	617180.98	89	23	6038.3926	20276.3150
76	37	94931.18	504740.16	90	24	4437.6752	14237.9224
77	38	79463.879	409808.976	91	25	3073.6823	9800.2472
78	39	66164.998	330345.097	92	26	2056.0651	6726.5649
79	40	54966.538	264180.099	93	27	1386.2826	4670.4998
80	41	45120.585	209213.561	94	28	961.22562	3284.21716
81	42	36870.354	164092.976	95	29	674.19641	2322.99154
82	43	29695.922	127222.622	96	30	482.83396	1648.79513
83	44	23722.554	97526.700	97	31	352.87968	1165.96117
84	45	18721.842	73804.146	98	32	256.28383	813.08149
85	46	14637.527	55082.304	99	33	188.04337	556.79766
86	47	11219.798	40444.777	100	34	143.68604	368.75429
87	48	8412.3227	29224.9793	101	35	104.35959	225.06825
88	49	6133.5495	20812.6566	102	36	69.60184	120.70866
89	50	4452.5930	14679.1071	103	37	38.98153	51.10682
90	51	3251.2472	10226.5141	104	38	12.12529	12.12529
91	52	2235.5954	6975.2669				
92	53	1483.5658	4739.6715				

Difference of Age 66 years.

COMMUTATION TABLES FOR JOINT ANNUITIES.

Difference of Age 40 years.

AGES.		D _{x,y}	N _{x,y}	AGES.		D _{x,y}	N _{x,y}
(x)	(y)			(x)	(y)		
40	0	4934026.0	44516907.2	94	54	692.82493	2313.22961
41	1	3887158.5	39582881.2	95	55	481.92383	1620.40468
42	2	3325097.5	35695722.7	96	56	342.31404	1138.48085
43	3	2891085.0	32370625.2	97	57	247.93193	796.16681
44	4	2585687.9	29479540.2	98	58	178.11911	548.23488
45	5	2334204.7	26893852.3	99	59	128.83307	370.11577
46	6	2130849.5	24559647.6	100	60	96.63065	241.28270
47	7	1956125.4	22428798.1	101	61	68.52855	144.65205
48	8	1802457.4	20472672.7	102	62	44.52577	76.12350
49	9	1665704.9	18670215.3	103	63	24.26046	31.59773
50	10	1542040.3	17004510.4	104	64	7.33727	7.33727
51	11	1428791.7	15462470.1	Difference of Age 65 years.			
52	12	1322247.3	14033678.4	65	0	683656.61	4173944.11
53	13	1222298.9	12711431.1	66	1	523278.79	3490287.50
54	14	1128612.4	11489132.2	67	2	434577.61	2967008.71
55	15	1040956.0	10360519.8	68	3	366346.86	2532431.10
56	16	958462.8	9319563.8	69	4	317052.10	2166084.24
57	17	881079.81	8361101.04	70	5	276247.84	1849032.14
58	18	808210.51	7480021.23	71	6	242752.08	1572784.30
59	19	738826.32	6671810.72	72	7	212886.85	1330032.22
60	20	672550.00	5932984.40	73	8	185507.71	1117145.37
61	21	608903.15	5260434.40	74	9	160274.77	931637.66
62	22	550033.53	4651531.25	75	10	136869.74	771362.89
63	23	495995.08	4101497.72	76	11	116264.03	634493.15
64	24	446852.39	3605502.64	77	12	97914.675	518229.117
65	25	401921.72	3158650.25	78	13	82036.353	420314.442
66	26	360933.11	2756728.53	79	14	68613.402	338278.089
67	27	323628.76	2395795.42	80	15	56749.788	269664.687
68	28	289491.58	2072166.66	81	16	46729.816	212914.899
69	29	258154.17	1782675.08	82	17	37929.542	166185.083
70	30	229305.62	1524520.91	83	18	30535.742	128255.541
71	31	203081.24	1295215.29	84	19	24290.471	97719.799
72	32	178471.11	1092134.05	85	20	19141.623	73429.328
73	33	155308.78	913662.94	86	21	14787.733	54287.705
74	34	133714.53	758354.16	87	22	11173.634	39499.972
75	35	113606.12	624639.63	88	23	8204.2073	28326.3382
76	36	95943.587	511033.509	89	24	5995.8616	20122.1309
77	37	80335.931	415089.922	90	25	4406.1970	14126.2693
78	38	66912.187	334753.991	91	26	3051.2008	9720.0723
79	39	55627.219	267841.804	92	27	2040.9159	6668.8715
80	40	45715.107	212214.585	93	28	1375.5139	4627.9556
81	41	37385.345	166499.478	94	29	952.86423	3252.44169
82	42	30128.950	129114.133	95	30	667.57040	2299.57746
83	43	24073.596	98985.183	96	31	477.95597	1632.00706
84	44	19003.046	74911.587	97	32	349.27822	1154.05109
85	45	14857.545	55908.541	98	33	253.68761	804.77287
86	46	11388.535	41050.996	99	34	186.15331	551.08526
87	47	8536.9911	29662.4613	100	35	142.22716	364.93195
88	48	6220.2282	21125.4702	101	36	103.28913	222.70479
89	49	4514.3643	14905.2420	102	37	68.86739	119.41566
90	50	3295.4667	10390.8777	103	38	38.55838	50.54827
91	51	2268.0105	7095.4110	104	39	11.98989	11.98989
92	52	1506.4658	4827.4005				
93	53	1007.7051	3320.9347				

Difference of Age 65 years.

COMMUTATION TABLES FOR JOINT ANNUITIES.

Difference of Age 41 years.

AGES.		D _{xy}	N _{xy}	AGES.		D _{xy}	N _{xy}
(x)	(y)			(x)	(y)		
41	0	4594207.0	41152899.5	95	54	490.20634	1654.80715
42	1	3616615.2	36558692.5	96	55	348.56128	1164.60081
43	2	3091799.6	32942077.3	97	56	252.73388	816.03953
44	3	2687667.1	29850277.7	98	57	181.92072	563.30565
45	4	2403231.5	27162610.6	99	58	132.02899	381.38493
46	5	2169470.3	24759379.1	100	59	99.44230	249.35594
47	6	1980450.9	22589908.8	101	60	70.90302	149.91364
48	7	1818452.3	20609457.9	102	61	46.17827	79.01062
49	8	1676736.1	18791005.6	103	62	25.20326	32.83235
50	9	1549917.6	17114269.5	104	63	7.62909	7.62909
51	10	1435234.7	15564351.9	Difference of Age 64 years.			
52	11	1328651.9	14129117.2	64	0	754690.75	4713904.85
53	12	1228441.1	12800465.3	65	1	578441.86	3959214.10
54	13	1134491.5	11572024.2	66	2	481099.84	3380772.24
55	14	1046739.1	10437532.7	67	3	406365.54	2899672.40
56	15	964433.11	9390793.61	68	4	352446.43	2493306.86
57	16	887030.19	8426360.50	69	5	307945.57	2140860.43
58	17	813837.62	7539330.31	70	6	271330.08	1832914.86
59	18	744006.42	6725492.69	71	7	239770.40	1561584.78
60	19	677298.71	5981486.27	72	8	211014.33	1321814.38
61	20	613233.04	5304187.56	73	9	184287.26	1110800.05
62	21	553880.56	4690954.52	74	10	159460.19	926512.79
63	22	499488.59	4137073.96	75	11	136255.31	767052.60
64	23	450022.09	3637585.37	76	12	115703.59	630797.29
65	24	404793.08	3187563.28	77	13	97425.101	515093.696
66	25	363592.49	2782770.20	78	14	81611.227	417668.595
67	26	326030.98	2419177.71	79	15	68234.323	336057.368
68	27	291757.96	2093146.73	80	16	56398.479	267823.045
69	28	260419.47	1801388.77	81	17	46416.343	211424.566
70	29	231581.61	1540969.30	82	18	37667.285	165008.223
71	30	205153.87	1309387.69	83	19	30323.139	127340.937
72	31	180311.36	1104233.82	84	20	24120.165	97017.798
73	32	156898.19	923922.46	85	21	19006.468	72897.633
74	33	135072.16	767024.27	86	22	14685.023	53891.165
75	34	114771.42	631952.11	87	23	11095.483	39206.142
76	35	96937.914	517180.695	88	24	8146.4215	28110.6589
77	36	81192.684	420242.781	89	25	5953.3305	19964.2374
78	37	67646.497	339050.097	90	26	4373.9694	14010.9069
79	38	56255.408	271403.600	91	27	3028.7195	9636.9375
80	39	46264.589	215148.192	92	28	2025.0621	6608.2180
81	40	37877.945	168883.603	93	29	1363.5488	4583.1559
82	41	30549.779	131005.658	94	30	943.49947	3219.60713
83	42	24424.638	100455.879	95	31	660.82608	2276.10766
84	43	19284.250	76031.241	96	32	473.07800	1615.28158
85	44	15080.707	56746.991	97	33	345.73995	1142.20358
86	45	11559.718	41666.284	98	34	251.13776	796.46363
87	46	8665.381	30106.566	99	35	184.26325	545.32587
88	47	6312.4103	21441.1854	100	36	140.76829	361.06262
89	48	4578.1608	15128.7751	101	37	102.19921	220.29433
90	49	3341.1849	10550.6143	102	38	68.11983	118.09512
91	50	2298.8572	7209.4294	103	39	38.12781	49.97529
92	51	1528.3088	4910.5722	104	40	11.84748	11.84748
93	52	1023.2598	3382.2634				
94	53	704.19644	2359.00359				

Difference of Age 64 years

COMMUTATION TABLES FOR JOINT ANNUITIES.

Difference of Age 42 years.

AGES.		D _{x,y}	N _{x,y}	AGES.		D _{x,y}	N _{x,y}
(x)	(y)			(x)	(y)		
42	0	4274453.6	38016619.1	96	54	354.55177	1188.90678
43	1	3362863.7	33742165.5	97	55	257.34627	834.35501
44	2	2874259.3	30379301.8	98	56	185.44416	577.00874
45	3	2498014.5	27505042.5	99	57	134.84688	391.56458
46	4	2233625.6	25007028.0	100	58	101.90913	256.71770
47	5	2016345.8	22773402.4	101	59	72.96608	154.80857
48	6	1841065.7	20757056.6	102	60	47.77831	81.84249
49	7	1691615.3	18915990.9	103	61	26.13863	34.06418
50	8	1560182.0	17224375.6	104	62	7.92555	7.92555
51	9	1442566.4	15664193.6	Difference of Age 63 years.			
52	10	1334643.4	14221627.2	63	0	831787.83	5307689.89
53	11	1234391.4	12886983.8	64	1	638543.84	4475902.06
54	12	1140192.5	11652592.4	65	2	531816.48	3837358.22
55	13	1052191.7	10512399.9	66	3	449867.62	3305541.74
56	14	969791.07	9460208.22	67	4	390946.67	2855674.12
57	15	892555.52	8490417.15	68	5	342323.29	2464727.45
58	16	819333.87	7597861.63	69	6	302463.54	2122404.16
59	17	749186.51	6778527.76	70	7	267997.39	1819940.62
60	18	682047.42	6029341.25	71	8	237661.41	1551943.23
61	19	617562.93	5347293.83	72	9	209626.08	1314281.82
62	20	557819.18	4729730.90	73	10	183350.64	1104655.74
63	21	502982.10	4171911.72	74	11	158744.35	921305.10
64	22	453191.79	3668929.62	75	12	135598.50	762560.75
65	23	407664.44	3215737.83	76	13	115125.07	626962.25
66	24	366190.02	2808073.39	77	14	96920.229	511837.180
67	25	328433.19	2441883.37	78	15	81160.336	414916.951
68	26	293923.60	2113450.18	79	16	67811.921	333756.615
69	27	262458.25	1819526.58	80	17	56020.147	265944.694
70	28	233613.74	1557068.33	81	18	46095.407	209924.547
71	29	207190.13	1323454.59	82	19	37405.030	163829.140
72	30	182151.60	1116264.46	83	20	30110.536	126424.110
73	31	158515.99	934112.86	84	21	23949.858	96313.574
74	32	136454.48	775596.87	85	22	18874.457	72363.716
75	33	115936.72	639142.39	86	23	14582.314	53489.259
76	34	97932.242	523205.667	87	24	11017.333	38906.945
77	35	82034.138	425273.425	88	25	8088.6357	27889.6122
78	36	68367.921	343239.287	89	26	5909.7869	19800.9765
79	37	56872.767	274871.366	90	27	4341.7417	13891.1896
80	38	46787.047	217998.599	91	28	3005.1924	9549.4479
81	39	38333.227	171211.552	92	29	2007.4467	6544.2555
82	40	30952.312	132878.325	93	30	1350.1478	4536.8088
83	41	24765.792	101926.013	94	31	933.96749	3186.66101
84	42	19565.454	77160.221	95	32	654.08174	2252.69352
85	43	15303.869	57594.767	96	33	468.28561	1598.61178
86	44	11733.346	42290.898	97	34	342.26485	1130.32617
87	45	8795.6315	30557.5520	98	35	248.58789	788.06132
88	46	6407.3442	21761.9205	99	36	182.37319	539.47343
89	47	4646.0079	15354.5763	100	37	139.28288	357.10024
90	48	3388.4022	10708.5684	101	38	101.08983	217.81736
91	49	2330.7494	7320.1662	102	39	67.35915	116.72753
92	50	1549.0950	4989.4168	103	40	37.67497	49.36838
93	51	1038.0966	3440.3218	104	41	11.69341	11.69341
94	52	715.06625	2402.22525				
95	53	498.25222	1687.15900				

Difference of Age 63 years.

COMMUTATION TABLES FOR JOINT ANNUITIES.

Difference of Age 43 years.

AGES.		$D_{x,y}$	$N_{x,y}$	AGES.		$D_{x,y}$	$N_{x,y}$
(x)	(y)			(x)	(y)		
43	0	3974546.4	35095440.6	97	54	261.76912	851.34906
44	1	3126251.2	31120894.2	98	55	188.82851	589.57994
45	2	2671440.1	27994643.0	99	56	137.45860	400.75143
46	3	2321719.5	25323202.9	100	57	104.08418	263.29283
47	4	2075972.9	23001483.4	101	58	74.77612	159.20865
48	5	1874434.4	20925510.5	102	59	49.16851	84.43253
49	6	1712651.5	19051076.1	103	60	27.04432	35.26402
50	7	1574026.9	17338424.6	104	61	8.21970	8.21970
51	8	1452119.9	15764397.7	Difference of Age 62 years.			
52	9	1341461.2	14312277.8				
53	10	1239957.8	12970816.6	62	0	915959.25	5960301.73
54	11	1145715.3	11730858.8	63	1	703775.68	5044342.48
55	12	1057479.1	10585143.5	64	2	587073.93	4340566.80
56	13	974842.87	9527664.44	65	3	497291.82	3753492.87
57	14	897514.16	8552821.57	66	4	432798.13	3256201.05
58	15	824437.53	7655307.41	67	5	379717.71	2823402.92
59	16	754246.14	6830869.88	68	6	336229.26	2443685.21
60	17	686796.14	6076623.74	69	7	298748.44	2107455.95
61	18	621892.82	5389827.60	70	8	265640.12	1808707.51
62	19	561757.81	4767934.78	71	9	236097.85	1543067.39
63	20	506558.79	4206176.97	72	10	208560.67	1306969.54
64	21	456361.50	3699618.18	73	11	182527.55	1098408.87
65	22	410535.79	3243256.68	74	12	157979.14	915881.32
66	23	368787.55	2832720.89	75	13	134920.51	757902.18
67	24	330779.54	2463933.34	76	14	114528.48	622981.67
68	25	296089.25	2133153.80	77	15	96384.758	508453.192
69	26	264406.41	1837064.55	78	16	80657.916	412068.434
70	27	235442.66	1572658.14	79	17	67357.025	331410.518
71	28	209008.23	1337215.48	80	18	55632.808	264053.493
72	29	183959.55	1128207.25	81	19	45774.470	208420.685
73	30	160133.79	944247.70	82	20	37142.774	162646.215
74	31	137861.48	784113.91	83	21	29897.933	125503.441
75	32	117123.21	646252.43	84	22	23783.512	95605.508
76	33	98926.569	529129.218	85	23	18742.446	71821.996
77	34	82875.593	430202.649	86	24	14479.604	53079.550
78	35	69076.464	347327.056	87	25	10939.183	38599.946
79	36	57479.294	278250.592	88	26	8029.474	27660.763
80	37	47300.498	220771.298	89	27	5866.2432	19631.2894
81	38	38766.117	173470.800	90	28	4308.0150	13765.0462
82	39	31324.349	134704.683	91	29	2979.0512	9457.0312
83	40	25092.113	103380.334	92	30	1987.7175	6477.9800
84	41	19838.737	78288.221	93	31	1336.5075	4490.2625
85	42	15527.030	58449.484	94	32	924.4355	3153.7550
86	43	11906.974	42922.454	95	33	647.45574	2229.31953
87	44	8927.7428	31015.4805	96	34	463.57879	1581.86379
88	45	6503.6538	22087.7377	97	35	338.78977	1118.28500
89	46	4715.8803	15584.0839	98	36	246.03804	779.49523
90	47	3438.6174	10868.2036	99	37	180.44877	533.45719
91	48	2363.6873	7429.5862	100	38	137.77095	353.00842
92	49	1570.5857	5065.8989	101	39	99.96099	215.23747
93	50	1052.2155	3495.3132	102	40	66.55914	115.27648
94	51	725.43437	2443.09766	103	41	37.18501	48.71734
95	52	505.94312	1717.66329	104	42	11.53233	11.53233
96	53	360.37111	1211.72017				

Difference of Age 62 years.

COMMUTATION TABLES FOR JOINT ANNUITIES.

[Difference of Age 44 years.]

AGES.		D _{x,y}	N _{x,y}	AGES.		D _{x,y}	N _{x,y}
(x)	(y)			(x)	(y)		
44	0	3694895.6	32376769.6	98	54	192.07378	601.23710
45	1	2905650.4	28681874.0	99	55	139.96722	409.16332
46	2	2482905.7	25776223.6	100	56	106.10008	269.19610
47	3	2157849.0	23293317.9	101	57	76.37207	163.09602
48	4	1929864.9	21135468.9	102	58	50.38821	86.72395
49	5	1743692.7	19205604.0	103	59	27.83123	36.33574
50	6	1593600.8	17461911.3	104	60	8.50451	8.50451
51	7	1465005.9	15868310.5	Difference of Age 61 years.			
52	8	1350345.0	14403304.6				
53	9	1246291.9	13052959.6	61	0	1006950.8	6676242.95
54	10	1150881.8	11806667.7	62	1	774993.12	5669292.15
55	11	1062601.3	10655785.9	63	2	647047.75	4894299.03
56	12	979741.57	9593184.59	64	3	548962.05	4247251.28
57	13	902189.45	8613443.02	65	4	478422.89	3698289.23
58	14	829017.74	7711253.57	66	5	420367.09	3219866.34
59	15	758944.37	6882235.83	67	6	372957.98	2799499.25
60	16	691434.42	6123291.46	68	7	332099.42	2426541.27
61	17	626222.71	5431857.04	69	8	296120.68	2094441.85
62	18	565696.43	4805634.33	70	9	263892.49	1798321.17
63	19	510135.47	4239937.90	71	10	234897.91	1534428.68
64	20	459606.67	3729802.43	72	11	207624.41	1299530.77
65	21	413407.15	3270195.76	73	12	181647.69	1091906.36
66	22	371385.08	2856788.61	74	13	157189.24	910258.67
67	23	333125.89	2485403.53	75	14	134221.33	753069.43
68	24	298204.53	2152277.64	76	15	113895.72	618848.10
69	25	266354.57	1854073.11	77	16	95788.091	504952.377
70	26	237190.29	1587718.54	78	17	80116.846	409164.286
71	27	210644.51	1350528.25	79	18	66891.298	329047.440
72	28	185573.80	1139883.74	80	19	55245.468	262156.142
73	29	161723.21	954309.94	81	20	45453.534	206910.674
74	30	139268.48	792586.73	82	21	36880.518	161457.140
75	31	118330.88	653318.25	83	22	29690.274	124576.622
76	32	99938.976	534987.370	84	23	23617.166	94886.348
77	33	83717.047	435048.394	85	24	18610.435	71269.182
78	34	69785.006	351331.347	86	25	14376.895	52658.747
79	35	58074.991	281546.341	87	26	10859.172	38281.852
80	36	47804.940	223471.350	88	27	7970.3124	27422.6802
81	37	39191.545	175666.410	89	28	5820.6742	19452.3678
82	38	31678.090	136474.865	90	29	4270.5410	13631.6936
83	39	25393.713	104796.775	91	30	2949.7730	9361.1526
84	40	20100.137	79403.062	92	31	1967.6360	6411.3796
85	41	15743.906	59302.925	93	32	1322.8672	4443.7436
86	42	12080.602	43559.019	94	33	915.07075	3120.87643
87	43	9059.854	31478.417	95	34	640.94806	2205.80568
88	44	6601.3393	22418.5632	96	35	458.87197	1564.85762
89	45	4786.7654	15817.2239	97	36	335.31467	1105.98565
90	46	3490.3316	11030.4585	98	37	243.44182	770.67098
91	47	2398.7165	7540.1269	99	38	178.48999	527.22916
92	48	1592.7811	5141.4104	100	39	136.23250	348.73917
93	49	1066.8130	3548.6293	101	40	98.77376	212.50667
94	50	735.30081	2481.81626	102	41	65.69354	113.73291
95	51	513.27906	1746.51545	103	42	36.67279	48.03937
96	52	365.93371	1233.23639	104	43	11.36658	11.36658
97	53	266.06558	867.30268				

Difference of Age 61 years.

COMMUTATION TABLES FOR JOINT ANNUITIES.

Difference of Age 43 years.

AGES.		D _{x,y}	N _{x,y}	AGES.		D _{x,y}	N _{x,y}
(x)	(y)			(x)	(y)		
43	0	3974546.4	35095440.6	97	54	261.76912	851.34906
44	1	3126251.2	31120894.2	98	55	188.82851	589.57994
45	2	2671440.1	27994643.0	99	56	137.45860	400.75143
46	3	2321719.5	25323202.9	100	57	104.08418	263.29283
47	4	2075972.9	23001483.4	101	58	74.77612	159.20865
48	5	1874434.4	20925510.5	102	59	49.16851	84.43253
49	6	1712651.5	19051076.1	103	60	27.04432	35.26402
50	7	1574026.9	17338424.6	104	61	8.21970	8.21970
51	8	1452119.9	15764397.7	Difference of Age 62 years.			
52	9	1341461.2	14312277.8				
53	10	1239957.8	12970816.6	62	0	915959.25	5960301.73
54	11	1145715.3	11730858.8	63	1	703775.68	5044342.48
55	12	1057479.1	10585143.5	64	2	587073.93	4340566.80
56	13	974842.87	9527664.44	65	3	497291.82	3753492.87
57	14	897514.16	8552821.57	66	4	432798.13	3256201.05
58	15	824437.53	7655307.41	67	5	379717.71	2823402.92
59	16	754246.14	6830869.88	68	6	336229.26	2443685.21
60	17	686796.14	6076623.74	69	7	298748.44	2107455.95
61	18	621892.82	5389827.60	70	8	265640.12	1808707.51
62	19	561757.81	4767934.78	71	9	236097.85	1543067.39
63	20	506558.79	4206176.97	72	10	208560.67	1306969.54
64	21	456361.50	3699618.18	73	11	182527.55	1098408.87
65	22	410535.79	3243256.68	74	12	157979.14	915881.32
66	23	368787.55	2832720.89	75	13	134920.51	757902.18
67	24	330779.54	2463933.34	76	14	114528.48	622981.67
68	25	296089.25	2133153.80	77	15	96384.758	508453.192
69	26	264406.41	1837064.55	78	16	80657.916	412068.434
70	27	235442.66	1572658.14	79	17	67357.025	331410.518
71	28	209008.23	1337215.48	80	18	55632.808	264053.493
72	29	183959.55	1128207.25	81	19	45774.470	208420.685
73	30	160133.79	944247.70	82	20	37142.774	162646.215
74	31	137861.48	784113.91	83	21	29897.933	125503.441
75	32	117123.21	646252.43	84	22	23783.512	95605.508
76	33	98926.569	529129.218	85	23	18742.446	71821.996
77	34	82875.593	430202.649	86	24	14479.604	53079.550
78	35	69076.464	347327.056	87	25	10939.183	38599.946
79	36	57479.294	278250.592	88	26	8029.474	27660.763
80	37	47300.498	220771.298	89	27	5866.2432	19631.2894
81	38	38766.117	173470.800	90	28	4308.0150	13765.0462
82	39	31324.349	134704.683	91	29	2979.0512	9457.0312
83	40	25092.113	103380.334	92	30	1987.7175	6477.9800
84	41	19838.737	78288.221	93	31	1336.5075	4490.2625
85	42	15527.030	58449.484	94	32	924.4355	3153.7550
86	43	11906.974	42922.454	95	33	647.45574	2229.31953
87	44	8927.7428	31015.4805	96	34	463.57879	1581.86379
88	45	6503.6538	22087.7377	97	35	338.78977	1118.28500
89	46	4715.8803	15584.0839	98	36	246.03804	779.49523
90	47	3438.6174	10868.2036	99	37	180.44877	533.45719
91	48	2363.6873	7429.5862	100	38	137.77095	353.00842
92	49	1570.5857	5065.8989	101	39	99.96099	215.23747
93	50	1052.2155	3495.3132	102	40	66.55914	115.27648
94	51	725.43437	2443.09766	103	41	37.18501	48.71734
95	52	505.94312	1717.66329	104	42	11.53233	11.53233
96	53	360.37111	1211.72017				

Difference of Age 62 years.

COMMUTATION TABLES FOR JOINT ANNUITIES.

{Difference of Age 44 years.

AGES.		D_{xy}	N_{xy}	AGES.		D_{xy}	N_{xy}
(x)	(y)			(x)	(y)		
44	0	3694895.6	32376769.6	98	54	192.07378	601.23710
45	1	2905650.4	28681874.0	99	55	139.96722	409.16332
46	2	2482905.7	25776223.6	100	56	106.10008	269.19610
47	3	2157849.0	23293317.9	101	57	76.37207	163.09602
48	4	1929864.9	21135468.9	102	58	50.38821	86.72395
49	5	1743692.7	19205604.0	103	59	27.83123	36.33574
50	6	1593600.8	17461911.3	104	60	8.50451	8.50451
51	7	1465005.9	15868310.5	Difference of Age 61 years.			
52	8	1350345.0	14403304.6				
53	9	1246291.9	13052959.6	61	0	1006950.8	6676242.95
54	10	1150881.8	11806667.7	62	1	774993.12	5669292.15
55	11	1062601.3	10655785.9	63	2	647047.75	4894299.03
56	12	979741.57	9593184.59	64	3	548962.05	4247251.28
57	13	902189.45	8613443.02	65	4	478422.89	3698289.23
58	14	829017.74	7711253.57	66	5	420367.09	3219866.34
59	15	758944.37	6882235.83	67	6	372957.98	2799499.25
60	16	691434.42	6123291.46	68	7	332099.42	2426541.27
61	17	626222.71	5431857.04	69	8	296120.68	2094441.85
62	18	565696.43	4805634.33	70	9	263892.49	1798321.17
63	19	510135.47	4239937.90	71	10	234897.91	1534428.68
64	20	459606.67	3729802.43	72	11	207624.41	1299530.77
65	21	413407.15	3270195.76	73	12	181647.69	1091906.36
66	22	371385.08	2856788.61	74	13	157189.24	910258.67
67	23	333125.89	2485403.53	75	14	134221.33	753069.43
68	24	298204.53	2152277.64	76	15	113895.72	618848.10
69	25	266354.57	1854073.11	77	16	95788.091	504952.377
70	26	237190.29	1587718.54	78	17	80116.846	409164.286
71	27	210644.51	1350528.25	79	18	66891.298	329047.440
72	28	185573.80	1139883.74	80	19	55245.468	262156.142
73	29	161723.21	954309.94	81	20	45453.534	206910.674
74	30	139268.48	792586.73	82	21	36880.518	161457.140
75	31	118330.88	653318.25	83	22	29690.274	124576.622
76	32	99938.976	534987.370	84	23	23617.166	94886.348
77	33	83717.047	435048.394	85	24	18610.435	71269.182
78	34	69785.006	351331.347	86	25	14376.895	52658.747
79	35	58074.991	281546.341	87	26	10859.172	38281.852
80	36	47804.940	223471.350	88	27	7970.3124	27422.6802
81	37	39191.545	175666.410	89	28	5820.6742	19452.3678
82	38	31678.090	136474.865	90	29	4270.5410	13631.6936
83	39	25393.713	104796.775	91	30	2949.7730	9361.1526
84	40	20100.137	79403.062	92	31	1967.6360	6411.3796
85	41	15743.906	59302.925	93	32	1322.8672	4443.7436
86	42	12080.602	43559.019	94	33	915.07075	3120.87643
87	43	9059.854	31478.417	95	34	640.94806	2205.80568
88	44	6601.3393	22418.5632	96	35	458.87197	1564.85762
89	45	4786.7654	15817.2239	97	36	335.31467	1105.98565
90	46	3490.3316	11030.4585	98	37	243.44182	770.67098
91	47	2398.7165	7540.1269	99	38	178.48999	527.22916
92	48	1592.7811	5141.4104	100	39	136.23250	348.73917
93	49	1066.8130	3548.6293	101	40	98.77376	212.50667
94	50	735.30081	2481.81626	102	41	65.69354	113.73291
95	51	513.27906	1746.51545	103	42	36.67279	48.03937
96	52	365.93371	1233.23639	104	43	11.36658	11.36658
97	53	266.06558	867.30268				

Difference of Age 61 years.

COMMUTATION TABLES FOR JOINT ANNUITIES.

Difference of Age 45 years.

AGES.		D_{xy}	N_{xy}	AGES.		D_{xy}	N_{xy}
(x)	(y)			(x)	(y)		
45	0	3434169.0	29847178.9	99	54	142.37274	416.99764
46	1	2700586.8	26413009.9	100	55	108.03641	274.62490
47	2	2307658.4	23712423.1	101	56	77.85124	166.58849
48	3	2005978.5	21404764.7	102	57	51.46365	88.73725
49	4	1795256.9	19398786.2	103	58	28.52163	37.27360
50	5	1622484.2	17603529.3	104	59	8.75197	8.75197
51	6	1483224.0	15981045.1	Difference of Age 60 years.			
52	7	1362327.9	14497821.1				
53	8	1254545.5	13135493.2	60	0	1104351.4	7459511.6
54	9	1156760.9	11880947.7	61	1	851981.07	6355160.25
55	10	1067393.0	10724186.8	62	2	712524.70	5503179.18
56	11	984487.19	9656793.76	63	3	605042.47	4790654.48
57	12	906723.07	8672306.57	64	4	528132.59	4185612.01
58	13	833336.22	7765583.50	65	5	464681.40	3657479.42
59	14	763160.73	6932247.28	66	6	412883.73	3192798.02
60	15	695741.38	6169086.55	67	7	368377.01	2779914.29
61	16	630451.90	5473345.17	68	8	329178.32	2411537.28
62	17	569635.06	4842893.27	69	9	294172.52	2082358.96
63	18	513712.16	4273258.21	70	10	262551.28	1788186.44
64	19	462851.84	3759546.05	71	11	233843.41	1525635.16
65	20	416346.87	3296694.21	72	12	206623.58	1291791.75
66	21	373982.61	2880347.34	73	13	180739.45	1085168.17
67	22	335472.24	2506364.73	74	14	156374.66	904428.72
68	23	300319.82	2170892.49	75	15	133479.78	748054.06
69	24	268257.43	1870572.67	76	16	113190.65	614574.28
70	25	238937.92	1602315.24	77	17	95145.527	501383.635
71	26	212208.08	1363377.32	78	18	79562.895	406238.108
72	27	187026.62	1151169.24	79	19	66425.572	326675.213
73	28	163142.33	964142.62	80	20	54858.128	260249.641
74	29	140650.80	801000.29	81	21	45132.598	205391.513
75	30	119538.56	660349.49	82	22	36624.361	160258.915
76	31	100969.46	540810.93	83	23	29482.615	123634.554
77	32	84573.80	439841.47	84	24	23450.820	94151.939
78	33	70493.549	355267.669	85	25	18478.424	70701.119
79	34	58670.687	284774.120	86	26	14271.740	52222.695
80	35	48300.375	226103.433	87	27	10779.161	37950.955
81	36	39609.508	177803.058	88	28	7908.399	27171.794
82	37	32025.732	138193.550	89	29	5770.042	19263.395
83	38	25680.480	106167.818	90	30	4228.5701	13493.3529
84	39	20341.735	80487.338	91	31	2919.9720	9264.7828
85	40	15951.352	60145.603	92	32	1947.5545	6344.8108
86	41	12249.339	44194.251	93	33	1309.4663	4397.2563
87	42	9191.9652	31944.9123	94	34	905.87321	3087.79002
88	43	6699.0248	22752.9471	95	35	634.44037	2181.91681
89	44	4858.6630	16053.9223	96	36	454.16515	1547.47644
90	45	3542.7953	11195.2593	97	37	331.77639	1093.31129
91	46	2434.7914	7652.4610	98	38	240.79923	761.53490
92	47	1616.3857	5217.6726	99	39	176.49684	520.73567
93	48	1081.8891	3601.2869	100	40	134.61448	344.23883
94	49	745.50171	2519.39781	101	41	97.48922	209.62435
95	50	520.26003	1773.89610	102	42	64.78859	112.13513
96	51	371.23958	1253.63607	103	43	36.14570	47.34654
97	52	270.17251	882.39649	104	44	11.20084	11.20084
98	53	195.22634	612.22398				

Difference of Age 60 years.

COMMUTATION TABLES FOR JOINT ANNUITIES.

Difference of Age 46 years.

AGES.		D _{x,y}	N _{x,y}	AGES.		D _{x,y}	N _{x,y}
(x)	(y)			(x)	(y)		
46	0	3191805.7	27494239.2	100	54	109.89316	279.72502
47	1	2509975.3	24302433.5	101	55	79.27203	169.83186
48	2	2145244.2	21792458.2	102	56	52.46040	90.55983
49	3	1866061.5	19647214.0	103	57	29.13036	38.09943
50	4	1670464.1	17781152.5	104	58	8.96907	8.96907
51	5	1510106.9	16110688.4	Difference of Age 59 years.			
52	6	1379269.2	14600581.5				
53	7	1265678.3	13221312.3	59	0	1204673.6	8310602.18
54	8	1164421.6	11955634.0	60	1	934391.73	7105928.58
55	9	1072845.6	10791212.4	61	2	783307.04	6171536.85
56	10	988926.65	9718366.83	62	3	666268.76	5388229.81
57	11	911115.01	8729440.18	63	4	582085.12	4721961.05
58	12	837523.84	7818325.17	64	5	512963.30	4139875.93
59	13	767136.15	6980801.33	65	6	456409.15	3626912.63
60	14	699606.61	6213665.18	66	7	407812.36	3170503.48
61	15	634379.00	5514058.57	67	8	365136.82	2762691.12
62	16	573482.09	4879679.57	68	9	327012.67	2397554.30
63	17	517288.85	4306197.48	69	10	292677.42	2070541.63
64	18	466097.01	3788908.63	70	11	261372.64	1777864.21
65	19	419286.60	3322811.62	71	12	232716.19	1516491.57
66	20	376641.99	2903525.02	72	13	205590.46	1283775.38
67	21	337818.59	2526883.03	73	14	179802.83	1078184.92
68	22	302435.10	2189064.44	74	15	155510.71	898382.09
69	23	270160.29	1886629.34	75	16	132653.47	742871.38
70	24	240644.91	1616469.05	76	17	112431.35	610217.91
71	25	213771.64	1375824.14	77	18	94487.662	497786.558
72	26	188414.87	1162052.50	78	19	79008.943	403298.896
73	27	164419.54	973637.63	79	20	65059.846	324289.953
74	28	141885.01	809218.09	80	21	54470.788	258330.107
75	29	120725.04	667333.08	81	22	44819.125	203859.319
76	30	101999.95	546608.04	82	23	36368.204	159040.194
77	31	85445.853	444608.089	83	24	29274.956	122671.990
78	32	71214.974	359162.236	84	25	23284.474	93397.034
79	33	59266.384	287947.262	85	26	18343.269	70112.560
80	34	48795.809	228680.878	86	27	14166.584	51769.291
81	35	40020.008	179885.069	87	28	10695.428	37602.707
82	36	32367.275	139865.061	88	29	7839.6064	26907.2793
83	37	25962.303	107497.786	89	30	5713.3340	19067.6729
84	38	20571.451	81535.483	90	31	4185.8497	13354.3389
85	39	16143.083	60964.032	91	32	2890.1711	9168.4892
86	40	12410.740	44820.949	92	33	1927.8253	6278.3181
87	41	9320.355	32410.209	93	34	1296.3046	4350.4928
88	42	6796.7104	23089.8536	94	35	896.67568	3054.18822
89	43	4930.5607	16293.1432	95	36	627.93268	2157.51254
90	44	3596.0084	11362.5825	96	37	449.37276	1529.57986
91	45	2471.3891	7766.5741	97	38	328.17494	1080.20710
92	46	1640.6949	5295.1850	98	39	238.11030	752.03216
93	47	1097.9224	3654.4901	99	40	174.40060	513.92186
94	48	756.03707	2556.56769	100	41	132.86383	339.52126
95	49	527.47765	1800.53062	101	42	96.14628	206.65743
96	50	376.28871	1273.05297	102	43	63.85743	110.51115
97	51	274.08989	896.76426	103	44	35.61863	46.65372
98	52	198.23981	622.67437	104	45	11.03509	11.03509
99	53	144.70954	424.43456				

Difference of Age 59 years.

COMMUTATION TABLES FOR JOINT ANNUITIES.

Difference of Age 47 years.

AGES.		D_{xy}	N_{xy}	AGES.		D_{xy}	N_{xy}
(x)	(y)			(x)	(y)		
47	0	2966523.2	25305670.3	101	54	80.63442	172.90729
48	1	2333321.9	22339147.1	102	55	53.41781	92.27287
49	2	1995613.5	20005825.2	103	56	29.69456	38.85506
50	3	1736346.9	18010211.7	104	57	9.16050	9.16050
51	4	1554763.6	16273864.8	Difference of Age 58 years.			
52	5	1404267.9	14719101.2				
53	6	1281417.7	13314833.3	58	0	1308631.0	9231236.24
54	7	1174754.6	12033415.6	59	1	1019274.3	7922605.24
55	8	1079950.5	10858661.0	60	2	859074.96	6903330.94
56	9	993978.44	9778710.52	61	3	732456.02	6044255.98
57	10	915223.60	8784732.08	62	4	640988.28	5311799.96
58	11	841580.59	7869508.48	63	5	565366.19	4670811.68
59	12	770991.10	7027927.89	64	6	503831.54	4105445.49
60	13	703250.97	6256936.79	65	7	450803.17	3601613.95
61	14	637903.33	5553685.82	66	8	404225.29	3150810.78
62	15	577054.33	4915782.49	67	9	362734.60	2746585.49
63	16	520782.36	4338728.16	68	10	325350.66	2383850.89
64	17	469342.18	3817945.80	69	11	291363.54	2058500.23
65	18	422226.32	3348603.62	70	12	260112.72	1767136.69
66	19	379301.36	2926377.30	71	13	231552.61	1507023.97
67	20	340220.81	2547075.94	72	14	204525.06	1275471.36
68	21	304550.38	2206855.13	73	15	178809.45	1070946.30
69	22	272063.14	1902304.75	74	16	154548.03	892136.85
70	23	242351.90	1630241.61	75	17	131763.61	737588.82
71	24	215298.84	1387889.71	76	18	111653.96	605825.21
72	25	189803.13	1172590.87	77	19	93829.798	494171.252
73	26	165639.99	982787.74	78	20	78454.991	400341.454
74	27	142995.80	817147.75	79	21	65494.120	321886.463
75	28	121784.40	674151.95	80	22	54092.456	256392.343
76	29	103012.35	552367.55	81	23	44505.652	202299.887
77	30	86317.906	449355.200	82	24	36112.047	157794.235
78	31	71949.281	363037.294	83	25	29067.297	121682.188
79	32	59872.911	291088.013	84	26	23114.168	92614.891
80	33	49291.244	231215.102	85	27	18208.115	69500.723
81	34	40430.508	181923.858	86	28	14056.538	51292.608
82	35	32702.718	141493.350	87	29	10602.392	37236.070
83	36	26239.181	108790.632	88	30	7762.5587	26633.6777
84	37	20797.206	82551.451	89	31	5655.6134	18871.1190
85	38	16325.384	61754.245	90	32	4143.1292	13215.5056
86	39	12559.913	45428.861	91	33	2860.8929	9072.3764
87	40	9443.1626	32868.9485	92	34	1908.4484	6211.4835
88	41	6891.6442	23425.7859	93	35	1283.1429	4303.0351
89	42	5002.4584	16534.1417	94	36	887.47814	3019.89220
90	43	3649.2215	11531.6833	95	37	621.30667	2132.41406
91	44	2508.5096	7882.4618	96	38	444.49478	1511.10739
92	45	1665.3564	5373.9522	97	39	324.51030	1066.61261
93	46	1114.4343	3708.5958	98	40	235.28228	742.10231
94	47	767.24133	2594.16153	99	41	172.13253	506.82003
95	48	534.93190	1826.92020	100	42	131.03360	334.68750
96	49	381.50900	1291.98830	101	43	94.76443	203.65390
97	50	277.81771	910.47930	102	44	62.92625	108.88947
98	51	201.11419	632.66159	103	45	35.09155	45.96322
99	52	146.94325	431.54740	104	46	10.87167	10.87167
100	53	111.69686	284.60415				

Difference of Age 58 years.

COMMUTATION TABLES FOR JOINT ANNUITIES.

Difference of Age 48 years.

AGES.		D _{xy}	N _{xy}	AGES.		D _{xy}	N _{xy}
(x)	(y)			(x)	(y)		
48	0	2757737.8	23270113.8	102	54	54.33586	93.91026
49	1	2170572.8	20512376.0	103	55	30.23648	39.57440
50	2	1856893.4	18341803.2	104	56	9.33792	9.33792
51	3	1616083.2	16484909.8	Difference of Age 57 years.			
52	4	1445794.8	14868826.6	57	0	1416754.8	10223772.7
53	5	1304642.9	13423031.8	58	1	1107232.7	8807017.9
54	6	1189363.3	12118388.9	59	2	937115.6	7699785.2
55	7	1089533.9	10929025.6	60	3	803305.21	6762669.58
56	8	1000561.1	9839491.7	61	4	704664.17	5959364.37
57	9	919898.89	8838930.59	62	5	622577.50	5254700.20
58	10	845375.63	7919031.70	63	6	555301.56	4632122.70
59	11	774725.59	7073656.07	64	7	497643.08	4076821.14
60	12	706784.90	6298930.48	65	8	446837.96	3579178.06
61	13	641226.26	5592145.58	66	9	401565.92	3132340.10
62	14	580260.18	4950919.32	67	10	360891.04	2730774.18
63	15	524026.33	4370659.14	68	11	323890.11	2369883.14
64	16	472511.88	3846632.81	69	12	289959.05	2045993.03
65	17	425166.05	3374120.93	70	13	258812.16	1756033.98
66	18	381960.74	2948954.88	71	14	230352.67	1497221.82
67	19	342623.03	2566994.14	72	15	203395.08	1266869.15
68	20	306716.03	2224371.11	73	16	177702.53	1063474.07
69	21	273966.00	1917655.08	74	17	153511.29	885771.54
70	22	244058.89	1643689.08	75	18	130852.56	732260.25
71	23	216826.04	1399630.19	76	19	110876.58	601407.69
72	24	191159.09	1182804.15	77	20	93171.933	490531.111
73	25	166860.44	991645.06	78	21	77901.040	397359.178
74	26	144057.22	824784.62	79	22	65039.224	319458.138
75	27	122737.83	680727.40	80	23	53714.124	254418.914
76	28	103916.29	557989.57	81	24	44192.180	200704.790
77	29	87174.659	454073.277	82	25	35855.890	156512.610
78	30	72683.590	366898.618	83	26	28854.694	120656.720
79	31	60490.269	294215.028	84	27	22943.861	91802.026
80	32	49795.687	233724.759	85	28	18066.674	68858.165
81	33	40841.008	183929.072	86	29	13934.265	50791.491
82	34	33038.162	143088.064	87	30	10498.192	36857.226
83	35	26511.116	110049.902	88	31	7684.1351	26359.0339
84	36	21019.001	83538.786	89	32	5597.8927	18674.8988
85	37	16504.542	62519.785	90	33	4101.1584	13077.0061
86	38	12701.750	46015.243	91	34	2832.1376	8975.8477
87	39	9556.6667	33313.4926	92	35	1889.0715	6143.7101
88	40	6982.4505	23756.8259	93	36	1269.9813	4254.6386
89	41	5072.3308	16774.3754	94	37	878.11339	2984.65735
90	42	3702.4346	11702.0446	95	38	614.56234	2106.54396
91	43	2545.6300	7999.6100	96	39	439.53123	1491.98162
92	44	1690.3702	5453.9800	97	40	320.65611	1052.45039
93	45	1131.1855	3763.6098	98	41	232.22245	731.79428
94	46	778.78004	2632.42431	99	42	169.76137	499.57183
95	47	542.85945	1853.64427	100	43	129.15033	329.81046
96	48	386.90044	1310.78482	101	44	93.38256	200.66013
97	49	281.67191	923.88438	102	45	61.99508	107.27757
98	50	203.84949	642.21247	103	46	34.57189	45.28249
99	51	149.07385	438.36298	104	47	10.71060	10.71060
100	52	113.42098	289.28913				
101	53	81.95789	175.86815				

Difference of Age 57 years.

COMMUTATION TABLES FOR JOINT ANNUITIES.

Difference of Age 49 years.

AGES.		$D_{x,y}$	$N_{x,y}$	AGES.		$D_{x,y}$	$N_{x,y}$
(x)	(y)			(x)	(y)		
49	0	256595.7	21376417.9	103	54	30.75614	40.26447
50	1	201966.9	18811031.3	104	55	9.59833	9.59833
51	2	172220.3	16791340.4	Difference of Age 56 years.			
52	3	1502816.7	15063070.1	56	0	1530846.2	11292335.1
53	4	1343223.6	13569243.4	57	1	1198716.2	9761548.9
54	5	1210920.1	12217019.8	58	2	1017984.1	8562832.7
55	6	1103082.9	11009099.7	59	3	876279.58	7544848.62
56	7	1009440.0	9909016.8	60	4	772825.11	6668569.04
57	8	925000.93	8893576.83	61	5	684424.47	5895743.93
58	9	849094.11	7967585.90	62	6	611494.40	5211319.46
59	10	778219.14	7117891.79	63	7	548480.89	4599825.06
60	11	710208.39	6339672.65	64	8	493265.87	4051344.17
61	12	644448.51	5629464.26	65	9	443898.24	3558078.30
62	13	583282.85	4985015.75	66	10	399525.00	3114180.06
63	14	526937.59	4401732.90	67	11	359270.94	2714655.06
64	15	475455.17	3874795.31	68	12	322328.83	2355384.12
65	16	428037.40	3399340.14	69	13	288509.26	2033055.29
66	17	384620.12	2971302.74	70	14	257470.95	1744546.03
67	18	345025.24	2586682.62	71	15	229080.00	1487075.08
68	19	308881.68	2241657.38	72	16	202135.97	1257995.08
69	20	275914.16	1932775.70	73	17	176510.47	1055859.11
70	21	245765.88	1656861.54	74	18	152449.87	879348.64
71	22	218353.24	1411095.66	75	19	129941.50	726898.77
72	23	192515.06	1192742.42	76	20	110099.20	596957.27
73	24	168052.50	1000227.36	77	21	92514.069	486858.066
74	25	145118.65	832174.86	78	22	77359.971	394343.997
75	26	123648.88	687056.21	79	23	64584.329	316984.026
76	27	104729.83	563407.33	80	24	53335.792	252399.697
77	28	87939.618	458677.505	81	25	43878.707	199063.905
78	29	73405.015	370737.887	82	26	35593.634	155185.198
79	30	61107.628	297332.872	83	27	28642.091	119591.564
80	31	50309.137	236225.244	84	28	22765.633	90949.473
81	32	41258.971	185916.107	85	29	17909.518	68183.840
82	33	33373.606	144657.136	86	30	13797.319	50274.322
83	34	26783.050	111283.530	87	31	10392.131	36477.003
84	35	21236.835	84500.480	88	32	7605.7114	26084.8719
85	36	16680.557	63263.645	89	33	5541.1847	18479.1605
86	37	12841.142	46583.088	90	34	4059.9370	12937.9758
87	38	9664.5886	33741.9465	91	35	2803.3822	8878.0388
88	39	7066.3774	24077.3579	92	36	1869.6946	6074.6566
89	40	5139.1652	17010.9805	93	37	1256.5803	4204.9620
90	41	3754.1488	11871.8153	94	38	868.5814	2948.3817
91	42	2582.7506	8117.6665	95	39	607.69969	2079.80026
92	43	1715.3840	5534.9159	96	40	434.31094	1472.10057
93	44	1148.1760	3819.5319	97	41	316.48600	1037.78963
94	45	790.4860	2671.3559	98	42	229.02354	721.30363
95	46	551.02364	1880.86986	99	43	167.32148	492.28009
96	47	392.63420	1329.84622	100	44	127.26704	324.95861
97	48	285.65246	937.21202	101	45	92.00071	197.69157
98	49	206.67752	651.55956	102	46	61.07702	105.69086
99	50	151.10136	444.88204	103	47	34.05966	44.61384
100	51	115.06554	293.78068	104	48	10.55418	10.55418
101	52	83.22298	178.71514				
102	53	55.22769	95.49216				

Difference of Age 56 years.

COMMUTATION TABLES FOR JOINT ANNUITIES.

Difference of Age 50 years.

AGES.		D _{x,y}	N _{x,y}	AGES.		D _{x,y}	N _{x,y}
(x)	(y)			(x)	(y)		
50	0	2387059.3	19612809.6	104	54	9.67175	9.67175
51	1	1879802.0	17225750.3	Difference of Age 55 years.			
52	2	1607150.3	15345948.3	55	0	1652311.1	12442418.9
53	3	1396200.2	13738798.0	56	1	1295249.0	10790107.8
54	4	1246729.2	12342597.8	57	2	1102093.6	9494858.8
55	5	1123075.9	11095868.6	58	3	951898.19	8392765.17
56	6	1021992.9	9972792.7	59	4	843030.58	7440866.98
57	7	934208.11	8950799.85	60	5	750627.65	6597836.40
58	8	855321.22	8016591.74	61	6	672240.36	5847208.75
59	9	782194.56	7161270.52	62	7	603983.53	5174968.39
60	10	713411.01	6379075.96	63	8	543656.52	4570984.86
61	11	647570.06	5665664.95	64	9	490020.70	4027328.34
62	12	586213.92	5018094.89	65	10	441642.17	3537307.64
63	13	529682.49	4431880.97	66	11	397731.46	3095665.47
64	14	478096.59	3902198.48	67	12	357539.11	2697934.01
65	15	430703.66	3424101.89	68	13	320717.19	2340394.90
66	16	387217.65	2993398.23	69	14	287014.16	2019677.71
67	17	347427.46	2606180.58	70	15	256048.46	1732663.55
68	18	311047.32	2258753.12	71	16	227661.89	1476615.09
69	19	277862.32	1947705.80	72	17	200780.00	1248953.20
70	20	247513.51	1669843.48	73	18	175290.02	1048173.20
71	21	219880.44	1422329.97	74	19	151388.44	872883.18
72	22	193871.03	1202449.53	75	20	129030.45	721494.74
73	23	169244.56	1008578.50	76	21	109321.81	592464.29
74	24	146155.38	839333.94	77	22	91871.504	483142.482
75	25	124550.94	693178.56	78	23	76818.903	391270.978
76	26	105507.21	568618.62	79	24	64129.433	314452.075
77	27	88628.081	463111.413	80	25	52957.460	250322.642
78	28	74049.145	374483.332	81	26	43557.771	197365.182
79	29	61714.155	300434.187	82	27	35331.378	153807.411
80	30	50822.588	238720.032	83	28	28419.600	118476.033
81	31	41684.399	187897.444	84	29	22567.602	90056.433
82	32	33715.149	146213.045	85	30	17733.503	67488.831
83	33	27054.984	112497.896	86	31	13657.928	49755.328
84	34	21454.669	85442.912	87	32	10286.069	36097.400
85	35	16853.429	63988.243	88	33	7528.6638	25811.3314
86	36	12978.088	47134.814	89	34	5485.4893	18282.6676
87	37	9770.6496	34156.7262	90	35	4018.7155	12797.1783
88	38	7146.1768	24386.0766	91	36	2774.6270	8778.4628
89	39	5200.9365	17239.8998	92	37	1849.9654	6003.8358
90	40	3803.6145	12038.9633	93	38	1242.9400	4153.8704
91	41	2618.8254	8235.3488	94	39	858.88219	2910.93039
92	42	1740.3978	5616.5234	95	40	600.48207	2052.04820
93	43	1165.1665	3876.1256	96	41	428.66276	1451.56613
94	44	802.35918	2710.95914	97	42	312.12634	1022.90337
95	45	559.30615	1908.59996	98	43	225.73190	710.77703
96	46	398.53913	1349.29381	99	44	164.88159	485.04513
97	47	289.88576	950.75468	100	45	125.38377	320.16354
98	48	209.59826	660.86892	101	46	90.63831	194.77977
99	49	153.19761	451.27066	102	47	60.17208	104.14146
100	50	116.63052	298.07305	103	48	33.56227	43.96938
101	51	84.42966	181.44253	104	49	10.40711	10.40711
102	52	56.08017	97.01287				
103	53	31.26095	40.93270				

Difference of Age 55 years.

COMMUTATION TABLES FOR JOINT ANNUITIES.

Difference of Age 51 years.

AGES.		D _{xy}	N _{xy}	AGES.		D _{xy}	N _{xy}
(x)	(y)			(x)	(y)		
51	0	2221725.6	17969446.7	Difference of Age 54 years.			
52	1	1748052.2	15747721.1	54	0	1781550.8	13679221.8
53	2	1493131.8	13999668.9	55	1	1398020.4	11897671.0
54	3	1295900.1	12506537.1	56	2	1190845.2	10499650.6
55	4	1156287.3	11210637.0	57	3	1030547.4	9308805.4
56	5	1040516.2	10054349.7	58	4	915779.97	8278258.00
57	6	945825.5	9013833.5	59	5	818816.64	7362478.03
58	7	862911.28	8068007.96	60	6	737264.99	6543661.39
59	8	787374.66	7205096.68	61	7	663983.36	5806396.40
60	9	717055.37	6417722.02	62	8	598670.97	5142413.04
61	10	650490.21	5700666.65	63	9	540079.84	4543742.07
62	11	589053.39	5050176.44	64	10	487530.22	4003662.23
63	12	532344.21	4461123.05	65	11	439659.57	3516132.01
64	13	480587.07	3928778.84	66	12	395814.24	3076472.44
65	14	433096.46	3448191.77	67	13	355751.41	2680658.20
66	15	389629.64	3015095.31	68	14	319055.18	2324906.79
67	16	349773.81	2625465.67	69	15	285428.44	2005851.61
68	17	313212.97	2275691.86	70	16	254463.40	1720423.17
69	18	279810.49	1962478.89	71	17	226134.69	1465959.77
70	19	249261.14	1682668.40	72	18	199391.75	1239825.08
71	20	221444.00	1433407.26	73	19	174069.58	1040433.33
72	21	195227.00	1211963.26	74	20	150327.02	866363.75
73	22	170436.62	1016736.26	75	21	128119.40	716036.73
74	23	147192.12	846299.64	76	22	108562.51	587917.33
75	24	125449.80	699107.52	77	23	91228.939	479354.818
76	25	106284.59	573657.72	78	24	76277.834	388125.879
77	26	89285.944	467373.127	79	25	63674.538	311848.045
78	27	74628.861	378087.183	80	26	52570.121	248173.507
79	28	62255.697	303458.322	81	27	43236.835	195603.386
80	29	51327.030	241202.625	82	28	35056.924	152366.551
81	30	42109.826	189875.595	83	29	28172.387	117309.627
82	31	34062.790	147765.769	84	30	22345.808	89137.240
83	32	27331.863	113702.979	85	31	17554.345	66791.432
84	33	21672.503	86371.116	86	32	13518.536	49237.087
85	34	17026.300	64698.613	87	33	10181.869	35718.551
86	35	13112.589	47672.313	88	34	7452.9919	25536.6823
87	36	9874.8501	34559.7244	89	35	5429.7939	18083.6904
88	37	7224.6005	24684.8743	90	36	3977.4941	12653.8965
89	38	5259.6698	17460.2738	91	37	2745.3488	8676.4024
90	39	3849.3329	12200.6040	92	38	1829.8838	5931.0536
91	40	2653.3318	8351.2711	93	39	1229.0605	4101.1698
92	41	1764.7070	5697.9393	94	40	848.68129	2872.10929
93	42	1182.1571	3933.2323	95	41	592.67284	2023.42800
94	43	814.23235	2751.07516	96	42	422.75784	1430.75516
95	44	567.70698	1936.84281	97	43	307.64032	1007.99732
96	45	404.52962	1369.13583	98	44	222.44027	700.35700
97	46	294.24541	964.60621	99	45	162.44169	477.91673
98	47	212.70445	670.36080	100	46	123.52702	315.47504
99	48	155.36257	457.65635	101	47	89.29536	191.94802
100	49	118.24854	302.29378	102	48	59.29337	102.65266
101	50	85.57797	184.04524	103	49	33.09459	43.35929
102	51	56.89330	98.46727	104	50	10.26470	10.26470
103	52	31.74348	41.57397				
104	53	9.83049	9.83049				

Difference of Age 54 years.

COMMUTATION TABLES FOR JOINT ANNUITIES.

Difference of Age 52 years.

AGES.		D_{xy}	N_{xy}	AGES.		D_{xy}	N_{xy}
(x)	(y)			(x)	(y)		
Difference of Age 53 years.							
52	0	2066011.4	16436869.5	53	0	1919439.3	15008796.3
53	1	1624037.6	14370858.1	54	1	1507370.1	13089357.0
54	2	1385868.4	12746820.5	55	2	1285332.8	11581986.9
55	3	1201891.1	11360952.1	56	3	1113537.5	10296654.1
56	4	1071286.2	10159061.0	57	4	991445.0	9183116.6
57	5	962968.24	9087774.82	58	5	889476.49	8191671.56
58	6	873642.06	8124806.58	59	6	804240.10	7302195.07
59	7	794361.77	7251164.52	60	7	728209.31	6497954.97
60	8	721804.07	6456802.75	61	8	658143.04	5769745.66
61	9	653813.16	5734998.68	62	9	594732.34	5111602.62
62	10	591709.67	5081185.52	63	10	537334.94	4516870.28
63	11	534922.75	4489475.85	64	11	485341.62	3979535.34
64	12	483002.08	3954553.10	65	12	437540.23	3494193.72
65	13	435352.53	3471551.02	66	13	393835.17	3056653.49
66	14	391794.25	3036198.49	67	14	353907.85	2662818.32
67	15	351952.56	2644404.24	68	15	317292.44	2308910.47
68	16	315328.25	2292451.68	69	16	283661.50	1991618.03
69	17	281758.65	1977123.43	70	17	252756.41	1707956.53
70	18	251008.78	1695364.78	71	18	224571.12	1455200.12
71	19	223007.56	1444356.00	72	19	198003.50	1230629.00
72	20	196615.25	1221348.44	73	20	172849.13	1032625.50
73	21	171628.69	1024733.19	74	21	149265.60	859776.37
74	22	148228.86	853104.50	75	22	127229.53	710510.77
75	23	126339.67	704875.64	76	23	107803.20	583281.24
76	24	107043.90	578535.97	77	24	90586.373	475478.042
77	25	89943.809	471492.073	78	25	75736.764	384891.669
78	26	75182.813	381548.264	79	26	63208.811	309154.905
79	27	62743.085	306365.451	80	27	52182.781	245946.094
80	28	51777.425	243622.366	81	28	42900.971	193763.313
81	29	42527.789	191844.941	82	29	34751.975	150862.342
82	30	34410.432	149317.152	83	30	27895.508	116110.367
83	31	27613.685	114906.720	84	31	22120.053	88214.859
84	32	21894.297	87293.035	85	32	17375.187	66094.806
85	33	17193.172	65398.738	86	33	13381.500	48719.619
86	34	13247.089	48199.566	87	34	10079.529	35338.029
87	35	9977.1897	34952.4771	88	35	7377.320	25258.500
88	36	7301.6482	24975.2874	89	36	5374.0985	17881.1802
89	37	5317.3905	17673.6392	90	37	3935.5231	12507.0817
90	38	3892.8028	12356.2487	91	38	2715.5479	8571.5586
91	39	2685.2240	8463.4459	92	39	1809.4500	5856.0107
92	40	1787.9593	5778.2219	93	40	1214.4630	4046.5607
93	41	1198.6690	3990.2626	94	41	837.64425	2832.09775
94	42	826.10553	2791.59359	95	42	584.50865	1994.45350
95	43	576.10782	1965.48806	96	43	416.68177	1409.94485
96	44	410.60570	1389.38024	97	44	303.15429	993.26308
97	45	298.66826	978.77454	98	45	219.14864	690.10879
98	46	215.90336	680.10628	99	46	160.03617	470.96015
99	47	157.66501	464.20292	100	47	121.69679	310.92398
100	48	119.91962	306.53791	101	48	87.99136	189.22719
101	49	86.76520	186.61829	102	49	58.46711	101.23583
102	50	57.66710	99.85309	103	50	32.64175	42.76872
103	51	32.20375	42.18599	104	51	10.12697	10.12697
104	52	9.98224	9.98224				

Difference of Age 53 years.

SPECIMEN TABLES OF RESULTS,

CONTAINING

VALUES OF JOINT ANNUITIES

AND

VALUES OF SURVIVORSHIP ASSURANCES,

AT

CARLISLE 3, $3\frac{1}{2}$, 4, 5, AND 6 PER CENT.

VALUES OF JOINT ANNUITIES OF £1 PER ANNUM. *

Difference of Age 15 years.

AGES.		Three per cent.	Three and a half per cent.	Four per cent.	Five per cent.	Six per cent.
(x)	(y)					
15	0	13.97625	12.90381	11.96788	10.42159	9.20563
16	1	16.11997	14.88304	13.80218	12.01363	10.60472
17	2	17.18120	15.86760	14.71816	12.81289	11.30909
18	3	18.05699	16.68541	15.48356	13.48772	11.90914
19	4	18.46778	17.07636	15.85536	13.82388	12.21356
20	5	18.72260	17.32517	16.09706	14.04983	12.42335
21	6	18.77342	17.38637	16.16557	14.12650	12.50277
22	7	18.71400	17.34610	16.14031	14.12231	12.51158
23	8	18.58343	17.24010	16.05416	14.06538	12.47421
24	9	18.40438	17.08908	15.92612	13.97191	12.40464
25	10	18.18946	16.90455	15.76671	13.85079	12.31051
26	11	17.95830	16.70461	15.59268	13.71655	12.20456
27	12	17.72460	16.50196	15.41589	13.57957	12.09599
28	13	17.49173	16.29975	15.23923	13.44238	11.98706
29	14	17.26925	16.10693	15.07116	13.31253	11.88455
30	15	17.06368	15.92967	14.91752	13.19532	11.79334
31	16	16.86556	15.75922	14.77019	13.08368	11.70719
32	17	16.66918	15.59027	14.62419	12.97325	11.62225
33	18	16.46572	15.41456	14.47178	12.85713	11.53232
34	19	16.25200	15.22905	14.31007	12.73267	11.43495
35	20	16.03067	15.03618	14.14129	12.60180	11.33184
36	21	15.80134	14.83554	13.96502	12.46409	11.22253
37	22	15.56400	14.62707	13.78117	12.31937	11.10684
38	23	15.32100	14.41296	13.59176	12.16941	10.98629
39	24	15.07204	14.19288	13.39646	12.01384	10.86051
40	25	14.82304	13.97241	13.20052	11.85736	10.73375
41	26	14.58287	13.75994	13.01191	11.70721	10.61263
42	27	14.34321	13.54764	12.82325	11.55679	10.49118
43	28	14.10627	13.33766	12.63658	11.40796	10.37114
44	29	13.87386	13.13168	12.45354	11.26228	10.25399
45	30	13.64868	12.93236	12.27670	11.12215	10.14199
46	31	13.41508	12.72484	12.09196	10.97477	10.02346
47	32	13.16995	12.50612	11.89638	10.81742	9.89586
48	33	12.90696	12.27009	11.68408	10.64458	9.75401
49	34	12.61893	12.00978	11.44829	10.44985	9.59182
50	35	12.31298	11.73183	11.19522	10.23867	9.41412
51	36	11.98809	11.43514	10.92368	10.00974	9.21952
52	37	11.66035	11.13503	10.64827	9.77634	9.02012
53	38	11.32939	10.83108	10.36854	9.53800	8.81546
54	39	10.99475	10.52283	10.08405	9.29423	8.60502
55	40	10.65768	10.21147	9.79587	9.04597	8.38960
56	41	10.32502	9.90355	9.51032	8.79905	8.17459
57	42	9.99217	9.59465	9.22312	8.54949	7.95626
58	43	9.66487	9.29031	8.93962	8.30226	7.73924
59	44	9.35273	8.99981	8.66883	8.06582	7.53151
60	45	9.06251	8.72982	8.41727	7.84645	7.33909
61	46	8.80299	8.48895	8.19342	7.65236	7.16997
62	47	8.54501	8.24918	7.97031	7.45851	7.00078
63	48	8.27890	8.00114	7.73887	7.25635	6.82346
64	49	7.99170	7.73222	7.48678	7.03415	6.62681
65	50	7.69131	7.44993	7.22123	6.79847	6.41684
66	51	7.37385	7.15042	6.93839	6.54550	6.18977
67	52	7.04721	6.84126	6.64550	6.28192	5.95175
68	53	6.71304	6.52398	6.34399	6.00895	5.70380

VALUES OF JOINT ANNUITIES OF £1 PER ANNUM.

Difference of Age 15 years.

AGES.		Three per cent.	Three and a half per cent.	Four per cent.	Five per cent.	Six per cent.
(x)	(y)					
69	54	6.37027	6.19747	6.03271	5.72535	5.44462
70	55	6.01883	5.86159	5.71144	5.43074	5.17367
71	56	5.65630	5.51387	5.37767	5.12254	4.88828
72	57	5.31017	5.18114	5.05759	4.82568	4.61220
73	58	4.99462	4.87735	4.76491	4.55346	4.35834
74	59	4.71881	4.61165	4.50876	4.31492	4.13562
75	60	4.49750	4.39873	4.30379	4.12457	3.95840
76	61	4.29912	4.20790	4.12011	3.95409	3.79978
77	62	4.11960	4.03531	3.95407	3.80015	3.65676
78	63	3.93865	3.86109	3.78623	3.64415	3.51147
79	64	3.73323	3.66254	3.59424	3.46436	3.34278
80	65	3.54235	3.47796	3.41568	3.29704	3.18573
81	66	3.33228	3.27419	3.21793	3.11057	3.00962
82	67	3.13836	3.08595	3.03514	2.93803	2.84651
83	68	2.93648	2.88954	2.84398	2.75676	2.67441
84	69	2.73554	2.69367	2.65299	2.57501	2.50125
85	70	2.52245	2.48538	2.44932	2.38013	2.31457
86	71	2.32187	2.28894	2.25689	2.19531	2.13689
87	72	2.15058	2.12097	2.09214	2.03669	1.98403
88	73	2.03278	2.00554	1.97900	1.92794	1.87940
89	74	1.91114	1.88606	1.86163	1.81460	1.76987
90	75	1.75777	1.73480	1.71241	1.66931	1.62831
91	76	1.70707	1.68467	1.66283	1.62077	1.58073
92	77	1.74417	1.72130	1.69900	1.65602	1.61509
93	78	1.79545	1.77219	1.74949	1.70571	1.66396
94	79	1.80144	1.77856	1.75622	1.71308	1.67189
95	80	1.80626	1.78407	1.76238	1.72044	1.68031
96	81	1.76298	1.74229	1.72204	1.68281	1.64518
97	82	1.67872	1.66013	1.64192	1.60655	1.57255
98	83	1.58708	1.57086	1.55493	1.52393	1.49404
99	84	1.45022	1.43694	1.42338	1.39841	1.37376
100	85	1.17028	1.16085	1.15156	1.13339	1.11574
101	86	.87917	.87307	.86706	.85526	.84377
102	87	.57185	.56853	.56525	.55880	.55249
103	88	.25248	.25126	.25005	.24767	.24534

Difference of Age 90 years.

90	0	1.876075	1.846725	1.818270	1.763890	1.712654
91	1	2.088622	2.055061	2.022518	1.960316	1.901702
92	2	2.275842	2.238853	2.202961	2.134306	2.069547
93	3	2.481749	2.441785	2.402971	2.328619	2.258362
94	4	2.586974	2.546344	2.506832	2.431001	2.359173
95	5	2.657839	2.617868	2.578937	2.504046	2.432900
96	6	2.635468	2.598177	2.561791	2.491613	2.424716
97	7	2.511701	2.478819	2.446669	2.384484	2.324982
98	8	2.355727	2.327872	2.300579	2.247620	2.196737
99	9	2.108596	2.086749	2.065295	2.023529	1.983224
100	10	1.668049	1.653222	1.638630	1.610128	1.582504
101	11	1.218933	1.209887	1.200963	1.183474	1.166452
102	12	.766216	.761618	.757072	.748135	.739399
103	13	.321948	.320392	.318852	.315815	.312836

**VALUES OF SURVIVORSHIP ASSURANCES OF £1 ON THE
OLD LIFE AGAINST THE YOUNGER
Difference of Age, 15 years.**

AGES.		Three per cent.	Three and a half per cent.	Four per cent.	Five per cent.	Six per cent.
(x)	(y)					
15	0	.163442	.148044	.131285	.105812	.087774
16	1	.199535	.175428	.155582	.125333	.103853
17	2	.217999	.191771	.170129	.137055	.113495
18	3	.234596	.206537	.183332	.147766	.122349
19	4	.245775	.216605	.192425	.155254	.128609
20	5	.255300	.225280	.200329	.161858	.134173
21	6	.262464	.231903	.206452	.167086	.138655
22	7	.268576	.237667	.211862	.171827	.142805
23	8	.273979	.242841	.216783	.176226	.146718
24	9	.278966	.247683	.221441	.180467	.150545
25	10	.283703	.252340	.225966	.184657	.154376
26	11	.288310	.256898	.230419	.188815	.158203
27	12	.293172	.261719	.235143	.193254	.162318
28	13	.298012	.266524	.239854	.197684	.166426
29	14	.302461	.270924	.244150	.201683	.170089
30	15	.306422	.274810	.247907	.205104	.173143
31	16	.310584	.278883	.251840	.208674	.176321
32	17	.315037	.283244	.256055	.212516	.179757
33	18	.319822	.287950	.260626	.216726	.183563
34	19	.324905	.292976	.265534	.221296	.187742
35	20	.330178	.298210	.270664	.226108	.192174
36	21	.335651	.303663	.276030	.231179	.196878
37	22	.341150	.309163	.281460	.236340	.201690
38	23	.346730	.314761	.287002	.241635	.206647
39	24	.352393	.320461	.292661	.247069	.211758
40	25	.357890	.325999	.298164	.252353	.216721
41	26	.363010	.331148	.303266	.257215	.221242
42	27	.367918	.336086	.308157	.261862	.225537
43	28	.372852	.341045	.313063	.266509	.229816
44	29	.378278	.346486	.318440	.271605	.234516
45	30	.384309	.352517	.324394	.277247	.239730
46	31	.390781	.359011	.330828	.283393	.245458
47	32	.397654	.365937	.337719	.290035	.251705
48	33	.405012	.373396	.345185	.297317	.258637
49	34	.413140	.381702	.353559	.305606	.266649
50	35	.421928	.390707	.362682	.314731	.275564
51	36	.431391	.400458	.372611	.324762	.285468
52	37	.441006	.410391	.382749	.335057	.295681
53	38	.450789	.420524	.393119	.345640	.306232
54	39	.460757	.430876	.403741	.356539	.317153
55	40	.471248	.441784	.414951	.368087	.328781
56	41	.482386	.453356	.426845	.380360	.341174
57	42	.494052	.465488	.439334	.393297	.354294
58	43	.505815	.477740	.451965	.406427	.367662
59	44	.516824	.489235	.463842	.418816	.380309
60	45	.526730	.499603	.474573	.430034	.391773
61	46	.534858	.508138	.483423	.439294	.401217
62	47	.542550	.516252	.491868	.448180	.410315
63	48	.549998	.524162	.500149	.456972	.419383
64	49	.557300	.532004	.508432	.465902	.428706
65	50	.564382	.539679	.516605	.474821	.438110
66	51	.571327	.547285	.524771	.483857	.447743
67	52	.578789	.555451	.533542	.493584	.458151
68	53	.586665	.564073	.542812	.503900	.469235

**VALUES OF SURVIVORSHIP ASSURANCES OF £1 ON THE
YOUNG LIFE AGAINST THE OLDER.
Difference of Age 15 years.**

AGES.		Three per cent.	Three and a half per cent.	Four per cent.	Five per cent.	Six per cent.
(x)	(y)					
15	0	.395357	.381779	.369950	.350303	.334549
16	1	.301825	.287464	.275104	.254970	.239276
17	2	.252451	.237827	.225325	.205188	.189764
18	3	.210346	.195406	.182685	.162343	.146945
19	4	.187202	.172118	.159292	.138847	.123462
20	5	.170246	.155028	.142091	.121484	.106015
21	6	.161612	.146335	.133334	.112605	.097037
22	7	.157230	.141934	.128895	.108063	.092388
23	8	.155629	.140344	.127287	.106374	.090591
24	9	.155858	.140609	.127555	.106584	.090702
25	10	.157380	.142192	.129161	.108162	.092199
26	11	.159506	.144396	.131401	.110397	.094369
27	12	.161451	.146426	.133476	.112481	.096400
28	13	.163394	.148461	.135560	.114583	.098457
29	14	.165425	.150580	.137729	.116768	.100597
30	15	.167452	.152689	.139880	.118928	.102706
31	16	.169060	.154380	.141615	.120674	.104404
32	17	.170327	.155732	.143015	.122091	.105776
33	18	.171468	.156968	.144305	.123411	.107060
34	19	.172609	.158215	.145617	.124768	.108393
35	20	.173782	.159504	.146979	.126188	.109798
36	21	.174989	.160835	.148392	.127674	.111280
37	22	.176404	.162385	.150034	.129404	.113017
38	23	.177901	.164028	.151776	.131251	.114884
39	24	.179489	.165770	.153629	.133225	.116892
40	25	.181245	.167688	.155662	.135392	.119104
41	26	.183119	.169723	.157814	.137679	.121440
42	27	.185192	.171964	.160180	.140196	.124018
43	28	.187159	.174106	.162453	.142635	.126535
44	29	.188503	.175631	.164116	.144477	.128466
45	30	.189030	.176340	.164964	.145508	.129591
46	31	.189362	.176863	.165636	.146380	.130572
47	32	.189629	.177334	.166266	.147230	.131548
48	33	.189931	.177857	.166965	.148179	.132645
49	34	.190183	.178354	.167661	.149163	.133814
50	35	.190315	.178748	.168271	.150095	.134957
51	36	.190315	.179030	.168786	.150964	.136069
52	37	.190246	.179245	.169240	.151784	.137143
53	38	.190103	.179391	.169629	.152550	.138176
54	39	.189882	.179463	.169949	.153260	.139167
55	40	.189208	.179084	.169823	.153533	.139732
56	41	.187759	.177925	.168912	.153018	.139510
57	42	.185788	.176238	.167469	.151965	.138748
58	43	.183558	.174279	.165742	.150608	.137664
59	44	.181640	.172607	.164280	.149478	.136775
60	45	.180187	.171369	.163225	.148706	.136203
61	46	.179618	.170980	.162984	.148689	.136331
62	47	.179440	.170974	.163120	.149034	.136810
63	48	.179743	.171452	.163741	.149869	.137779
64	49	.180806	.172704	.165153	.151520	.139588
65	50	.182474	.174574	.167194	.153823	.142069
66	51	.184775	.177097	.169906	.156834	.145289
67	52	.186826	.179386	.172401	.159658	.148353
68	53	.188684	.181493	.174727	.162341	.151305

**VALUES OF SURVIVORSHIP ASSURANCES OF £1 ON THE
OLD LIFE AGAINST THE YOUNGER.
Difference of Age 15 years.**

AGES.		Three per cent.	Three and a half per cent.	Four per cent.	Five per cent.	Six per cent.
(x)	(y)					
69	54	.594989	.573191	.552628	.514863	.481067
70	55	.603476	.582525	.562715	.526207	.493394
71	56	.612437	.592394	.573401	.538285	.506588
72	57	.620101	.600949	.582762	.549037	.518477
73	58	.626138	.607811	.590374	.557949	.528463
74	59	.631137	.613531	.596750	.565467	.536923
75	60	.634739	.617698	.601428	.571024	.543198
76	61	.640433	.623887	.608064	.578425	.551217
77	62	.645739	.629641	.614222	.585271	.558615
78	63	.651422	.635789	.620789	.592557	.566482
79	64	.658302	.643223	.628731	.601388	.576053
80	65	.663883	.649335	.635331	.608843	.584223
81	66	.670368	.656431	.642992	.617512	.593755
82	67	.674618	.661268	.648373	.623869	.600951
83	68	.678656	.665937	.653632	.630194	.608208
84	69	.681306	.669238	.657545	.635224	.614223
85	70	.683654	.672297	.661279	.640198	.620310
86	71	.681999	.671341	.660987	.641141	.622372
87	72	.678050	.668010	.658246	.639503	.621739
88	73	.670249	.660664	.651334	.633401	.616376
89	74	.666152	.657018	.648121	.630996	.614711
90	75	.673000	.664423	.656061	.639950	.624607
91	76	.665473	.657232	.649197	.633712	.618963
92	77	.646809	.638689	.630775	.615532	.601022
93	78	.624374	.616330	.608492	.593402	.579047
94	79	.602838	.594955	.587274	.572489	.558429
95	80	.583375	.575594	.568012	.553416	.539533
96	81	.566935	.559306	.551869	.537544	.523909
97	82	.562182	.554717	.547433	.533385	.519994
98	83	.557277	.549922	.542738	.528860	.515602
99	84	.563394	.556160	.549082	.535375	.522239
100	85	.599936	.593151	.586496	.573562	.561109
101	86	.647265	.640994	.634827	.622800	.611162
102	87	.709263	.703614	.698045	.687142	.676541
103	88	.794827	.789937	.785102	.775601	.766318
104	89	.866277	.862092	.857946	.849777	.841762

Difference of Age 90 years.

90	0	.708011	.697239	.686806	.666890	.648150
91	1	.781185	.769024	.757252	.734805	.713714
92	2	.807694	.794475	.781688	.757330	.734475
93	3	.833281	.818957	.805105	.778727	.753993
94	4	.847473	.832517	.818046	.790479	.764616
95	5	.860018	.844585	.829641	.801135	.774353
96	6	.869252	.853750	.838718	.809988	.782925
97	7	.878754	.863620	.848918	.820743	.794111
98	8	.887065	.872448	.858216	.830853	.804881
99	9	.896933	.883233	.869858	.844045	.819419
100	10	.912117	.900207	.888545	.865934	.844237
101	11	.926993	.916963	.907110	.887925	.869404
102	12	.942229	.934145	.926181	.910603	.895475
103	13	.957279	.951156	.945106	.933221	.921614
104	14	.968192	.963514	.958882	.949751	.940791

**VALUES OF SURVIVORSHIP ASSURANCES OF £1 ON THE
YOUNG LIFE AGAINST THE OLDER.
Difference of Age 15 years.**

AGES.		Three per cent.	Three and a half per cent.	Four per cent.	Five per cent.	Six per cent.
(x)	(y)					
69	54	.190344	.183417	.176883	.164883	.154143
70	55	.192092	.185441	.179153	.167567	.157153
71	56	.193690	.187330	.181304	.170166	.160113
72	57	.196108	.190027	.184254	.173550	.163851
73	58	.199261	.193438	.187899	.177600	.168235
74	59	.202296	.196703	.191374	.181442	.172381
75	60	.205139	.199736	.194580	.184949	.176138
76	61	.205224	.200000	.195009	.185666	.177098
77	62	.205147	.200083	.195237	.186150	.177796
78	63	.204733	.199827	.195126	.186293	.178152
79	64	.203837	.199106	.194567	.186023	.178129
80	65	.203815	.199236	.194835	.186536	.178848
81	66	.203449	.199031	.194780	.186746	.179285
82	67	.204847	.200560	.196429	.188606	.181323
83	68	.206689	.202533	.198523	.190912	.183807
84	69	.209892	.205855	.201955	.194537	.187593
85	70	.213750	.209839	.206055	.198843	.192073
86	71	.221248	.217439	.213748	.206701	.200068
87	72	.230186	.226450	.222825	.215893	.209354
88	73	.241418	.237699	.234089	.227173	.220639
89	74	.249058	.245385	.241817	.234976	.228504
90	75	.246677	.243096	.239615	.232940	.226621
91	76	.255680	.251982	.248387	.241490	.234958
92	77	.273264	.269286	.265417	.257991	.250954
93	78	.294205	.289924	.285759	.277755	.270163
94	79	.315567	.311084	.306718	.298317	.290332
95	80	.334889	.330259	.325743	.317040	.308751
96	81	.352590	.347959	.343437	.334703	.326363
97	82	.359797	.355327	.350955	.342493	.334390
98	83	.367371	.363140	.358995	.350953	.343226
99	84	.365241	.361431	.357691	.350415	.343398
100	85	.336852	.333777	.330752	.324848	.319133
101	86	.298002	.295665	.293362	.288855	.284474
102	87	.244955	.243344	.241753	.238629	.235582
103	88	.168692	.167750	.166819	.164986	.163192
104	89	.104597	.104092	.103591	.102605	.101638
Difference of Age 90 years.						
90	0	.208220	.206494	.204799	.201496	.198303
91	1	.128855	.127665	.126498	.124227	.122039
92	2	.096893	.095999	.095121	.093417	.091777
93	3	.065309	.064654	.064012	.062767	.061572
94	4	.048052	.047559	.047075	.046140	.045242
95	5	.033443	.033071	.032708	.032005	.031332
96	6	.024861	.024572	.024290	.023745	.023223
97	7	.018964	.018738	.018518	.018091	.017683
98	8	.015195	.015015	.014839	.014498	.014171
99	9	.012525	.012384	.012246	.011977	.011719
100	10	.010173	.010070	.009970	.009774	.009584
101	11	.008379	.008307	.008237	.008100	.007967
102	12	.006328	.006283	.006239	.006153	.006068
103	13	.004218	.004193	.004169	.004121	.004074
104	14	.002682	.002669	.002656	.002631	.002606

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